The ASB BULLETIN

Volume 47, Number 3 **September, 2000**

(Name will change to "Southeastern Biology" with the Volume 48, No. 1, January, 2001 issue)

ONLY CALL FOR PAPERS FOR THE 62ND MEETING

ABSTRACT SUBMISSION – SEE PAGE 257

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William D. and Madeline Burbanck. See page 237.

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Purpose

The purpose of this association shall be to promote the advancement of biology as a science by encouraging research, the imparting of knowledge, the application of knowledge to the solution of biological problems, and the preservation of biological resources. The ASB has representation in Section G Committee of the AAAS. Varying types of membership are available to individuals and institutions. Members receive *ASB Bulletin*.

Time and Place of Future Meetings

2000	April 5-8	University of Tennessee at Chattanooga, Chattanooga, TN
2001	April 4-7	Tulane and Loyola Universities, New Orleans, LA
2002		

A Message from the President
Howard S. Neufeld

As I looked over several recent presidential messages, I was struck by the fact that all of them strongly emphasized the role that ASB plays in fostering graduate education, most importantly by providing a non-intimidating forum for students to present the results of their research. For many students, the ASB meetings are where they give their first professional presentation. Although the meeting atmosphere is generally relaxed, I know from personal experience how harrowing one's first presentation can be. When I gave my first professional talk in 1982 at Knoxville, I was so nervous that my left leg would not stop shaking. My only solace was that I had a full-length lectern in front of me, so I was able to hide my jitters from the audience. Midway through the talk, I realized it was going well, my leg calmed down, and I even finished in time to answer a few questions. The point is, at ASB, most of us are there to hear the exciting new accomplishments of our students and fellow colleagues, and not to intimidate or browbeat. And because students are our greatest asset, we should continue to encourage them to participate. Last year, nearly half of the presentations were by our students. Such a strong presence by students speaks well for the future of our society.

One new trend I have noticed is that there are more undergraduates participating in the regular oral and poster sessions. This may reflect the new emphasis (at least on some campuses) of involving undergraduates in research, and I anticipate that it will not be long before one of our prestigious awards is given to a talented undergraduate (if that has not already occurred!). This can only be good for the society, as it serves to involve students at an earlier age in the scientific process, and, most importantly, can function, as Whit Gibbons mentioned a few years ago, to network students and prospective faculty advisors. At the same time I don't want to appear to be setting up an artificial dichotomy between these undergraduates and our participating Tri-Beta students. Tri-Beta is still the most prestigious organization recognizing academic achievement in the field of Biology, and will continue to bring exceptional young talent to the ASB meetings, and we look forward to their participation in all our future meetings.

This year the Society voted to change the Bulletin name to Southeastern Biology. This was done for a variety of reasons, not the least of which was to make cataloguing in libraries easier, but also because we felt that the old bulletin needed some updating and modernization. Our new editor is Dr. Jim Caponetti, from the University of Tennessee at Knoxville, and I would like to offer him, on behalf of ASB, a hearty welcome. If you have any suggestions or comments regarding our journal, please don't hesitate to let him or any member of the Executive Committee know your thoughts.

Finally, this begins the 64th year for ASB. Over these nearly seven decades there have been unprecedented advancements in all fields of science, especially in Biology. As most of you already know, this summer several groups announced that they had completed sequencing the entire human genome, an accomplishment that

will no doubt rank among the most amazing achievements of mankind. At the same time, the National Center for Science Education reports that belief in creationism is at an all time high, and organized opposition to the teaching of evolution in our public schools continues to grow. In addition, the American Association for the Advancement of Science recently reviewed 10 of the best selling biology textbooks for high school students, and gave none of them their endorsement. Said Dr. George Nelson, Director of the study, "...the textbooks are filled with pages of vocabulary and unnecessary detail, ...[and] provide only fragmentary treatment of some fundamentally important concepts...." These are disturbing reports in a country that leads the world in scientific achievements, and which serve as a warning to all of us that our educational mission is never complete. This coming year, our umbrella organization, AIBS, will be focusing on the evolution question as never before, and ASB will be supportive of these efforts. I would encourage all of you who are interested in the topic of science education to become involved with ASB's Education Committee, and it's goals and objectives. ASB can, and should, play a part in improving scientific literacy in the United States.

Finally, I look forward to an exciting year for the Society. Our meeting in New Orleans for next year is progressing and we have just learned that Dr. Peter Raven, Director of the Missouri Botanical Garden, and an internationally renowned scientist in the fields of botany, taxonomy, and biodiversity, will be our plenary speaker on Wednesday evening. So, start saving your pennies, and make plans to attend what I'm sure will be a great meeting next year. Hope to see you there!

Officers and staff of ASB. Seated from left: Bonnie Kelly, Kim Marie Tolson, Pat Parr, Howard Neufeld. Standing from Left: Gerhard Kalmus, Andy Ash, Robert Haynes, George Cline, Tim Atkinson, Joe Pollard, Jim Caponetti, Terry Richardson.

A Message from the Print Editor
James D. Caponetti

I have been a member of ASB for many years. It is now my pleasure to serve the membership as Print Editor. At the same time and on behalf of the association, I wish to thank the former Print Editor, Kenneth Shull, for his many years of service to his colleagues. I also wish to thank him personally for all his help and advice in the transition of the editorship.

As many of you know already, the bulletin's name has now been changed to *Southeastern Biology*. The former Print Editor, Ken Shull, raised the issue of how changing the name in the middle of a volume year would affect libraries. In a discussion with Ken and our new President, Howie Neufeld, we agreed to retain the title *The ASB Bulletin* until the end of the present volume year, and then change to *Southeastern Biology* with the January 2001 issue, and carry over the old numbering system as Volume 48, No. 1 for the January 2001 issue. I consulted one of the librarians at the University of Tennessee Library System. She concurred with us.

COVER PHOTO

William D. and Madeline Burbanck attending the annual banquet at the Chattanooga Marriott at the Convention and Trade Center, Friday evening, April 7, 2000. Bill was named Meritorious Teacher in 1981, President in 1964-65, and he has won the Outstanding Research Award. He is one of only four people to garner President, Outstanding Research Award, and Meritorious Teacher. Madeline was Vice-President in 1975-76 and President in 1977-78. She also has won the Outstanding Research Award, and served as Archivist for many years.

New President Howard Heufeld and new Print Editor Jim Caponetti.

Association of Southeastern Biologists
Minutes of the Annual Business Meeting, Friday, 7 April 2000
Chattanooga Marriott, Chattanooga, Tennessee

The 61st Annual Meeting of ASB was called to order by President Pat Parr at 11:35 A.M. with 94 members in attendance.

Pat Parr proceeded with the President's Report. She mentioned that Howie Neufeld had made new membership brochures and these should help with recruiting efforts. Examples of the brochure could be seen at the ASB desk. John Herr has agreed to be ASB archivist. Ken Shull is retiring as ASB Print Editor and is being replaced by Jim Caponetti of the University of Tennessee, Knoxville. The ASB Enrichment Fund was used this year to facilitate the attendance of five outstanding local high school teachers at this year's annual meeting. The Enrichment Fund was used in this way last year at UNC Wilmington. Pat encouraged members to check out the ASB web site and noted that the site would be a primary source of information concerning activities and events in which ASB is involved. She stated that ASB had cooperated with AIBS in composing resolutions and sending letters to state boards of education concerning the recent Kansas Board of Education decision concerning evolution. She asked that affiliated societies forward proposals for symposia or workshops for the 2001 meetings to Howie Neufeld before September so they can be discussed at the interim meetings.

Secretary Andy Ash asked that the previously distributed minutes of the 1998 business meeting be approved. A motion by Bill Martin to that effect was seconded by Mike Baranski and passed. He then requested a motion that five individuals applying for emeritus status (Eugene T. Berquist, Frank D. Bowers, William H. Ellis, Elizabeth D. Goodson and Homer F. Sharp) be approved. Such a motion by Claudia Jolls was seconded by Him Hardin and passed. Andy noted that five ASB members had passed away during the year: David J. Cotter, Walter F. Flory, H. Branch Howe, David Moore and William S. Woolcott. Eloise Carter asked for a moment of respect for these individuals.

Gerhard Kalmus reviewed the budget for 1 January-31 December 1998 indicating that ASB was in sound financial condition. He asked for a motion to accept the 1998 budget. .A motion by Ken McLeod was seconded by Dwayne Wise and passed. Gerhard then requested a motion to accept the proposed budget for 1999. A motion by Dwayne Wise was seconded by Bob Haynes and passed. Gerhard noted that current membership was 870, up about 15 from last year.

Ken Shull delivered the ASB Bulletin Editor's Report. He noted that the Bulletin published 214 pages in four issues in Volume 45 (1998). Sixteen book reviews, one research paper and one patron ad were published. Bulletin Volume 46 is the first to be published with the new ASB logo. Ken asked the membership for an assessment of the new Bulletin format with an irregular 4th edition. The membership seemed to approve of the new format. Ken asked the membership for interesting photographs to be placed on the Bulletin cover.

Whit Gibbons, Chair of the Resolutions Committee, read three resolutions that had been approved by the executive committee: 1. A resolution concerning Department of Energy Lands. 2. A resolution of support for Partners in Amphibian and Reptile Conservation. 3. A resolution of appreciation to UNC Wilmington, its administration, and the ASB Local Arrangements Committee. After some general discussion of the former two resolutions, Whit requested a motion of acceptance of the three resolutions, which was forthcoming. The motion was seconded and passed unanimously.

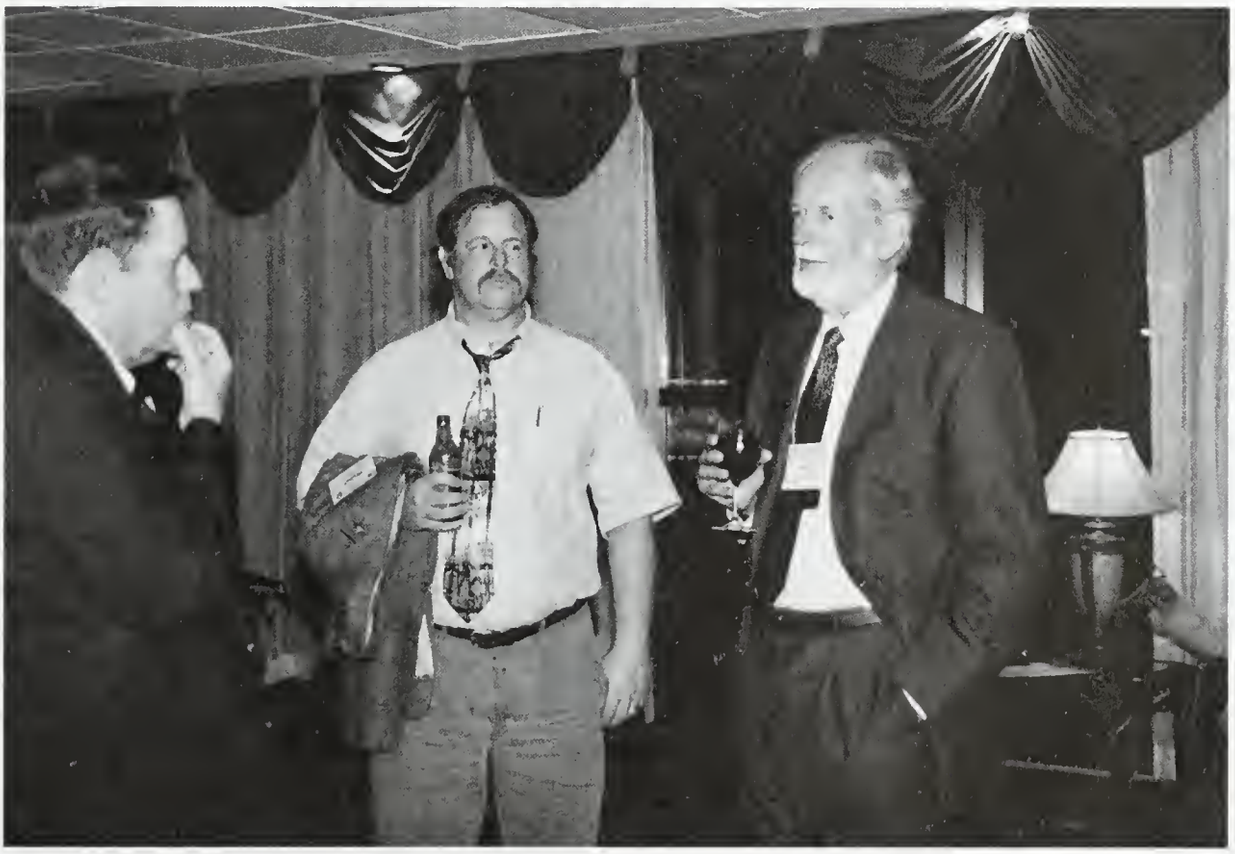
Nominations Committee member Mike Baranski introduced the slate for 1999-2000, and asked for nominations from the floor for each office in succession. There being no new nominations, he insured that everyone had a ballot that was eligible to vote. Voting then occurred.

Eloise Carter invited discussion of old business; there was none.

Eloise then proceeded to new business. She discussed the proposed bylaws change establishing the Poster Committee as a permanent committee (copies were distributed at the start of the meeting). Dwayne Wise moved that the bylaws change be accepted as written. The motion was seconded by Ken Shull and was passed.

The meeting was adjourned at 12:17 P.M.

Respectfully Submitted by Andrew N. Ash, Secretary



Ken Shull, Walter Diehl, and John Herr.

EVENTS OF THE 2000 ANNUAL MEETING AT THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA, CHATTANOOGA

2000 Meritorious Teaching Award Presented to Diane R. Nelson

The 2000 Meritorious Teaching Award was presented to Dr. Diane R. Nelson during the ASB banquet in Chattanooga, TN, April 7, 2000. This award includes a bronze plaque, the letters of support of her nomination, a formal citation, and a check for $1000 generously provided by the Carolina Biological Supply Company.

Diane Nelson is a native of Tennessee. She received her B.S., M.S., and Ph.D. from the University of Tennessee at Knoxville. She had been on the faculty of East Tennessee State University for more than 30 years prior to becoming Emerita in 1999. Diane has a distinguished record in both research and teaching, with the former focused on the biology of the Tardigrada. Her teaching interests span the spectrum for general biology to invertebrate zoology and marine biology. She has been a professor at the Harbor Branch Oceanographic Institution and the Bermuda Biological Station for Research. In addition to having extensive professional service in teaching, research and conservation, she is an acclaimed underwater photographer. A recipient of the ETSU Distinguished Faculty Award, Dr. Nelson is recognized by colleagues and students as an outstanding teacher, mentor, role model and friend.

Ronald Dimock presents the Meritorious Teaching Award to Diane Nelson.

The Association of Southeastern Biologists is very pleased to present the Meritorious Teaching Award for the year 2000 to Dr. Diane R. Nelson, Professor Emerita, East Tennessee State University, in recognition of her many years of excellence in scholarship and teaching. As the numerous testimonials from former students, collaborators and colleagues ascribe, Dr. Nelson epitomizes the teacher-scholar ideal. From her international travel and acclaimed underwater photography to her excellence in the classroom and highly personalized style of mentoring undergraduate and graduate students alike, and to her steadfast service to her university and the larger professional community, Dr. Nelson has been an exceptional role model for the modern university professor. Throughout her career the nurturing and encouragement of novice scholars of any age have been the focus of her endeavors. Whether explaining the "how to" of collecting tardigrades, leading field trips to the Great Barrier Reef, describing the esoterica of lophophorate coelomates, or assisting with inservice projects for teaching science at the K-12 level, Dr. Nelson conveyed her enthusiasm for science and a love of teaching and learning. As one former student admiringly declared, "She is a teacher in the truest, purest sense of the word. Her lectures are fascinating, her ability to communicate a gift, and her enthusiasm infectious. She is a performing artist in front of a classroom." For her contribution to the teaching of biological science, this award is respectfully presented this 7th day of April 2000, Chattanooga, Tennessee.

Howard Neufeld receives the gavel from Pat Parr.

2000 RESEARCH AWARD RECIPIENTS

ASB SENIOR RESEARCH AWARD

The ASB Senior Research Award sponsored by The William C. Brown Publishing Co. was presented by Walter Diehl to Dwayne Wise of Mississippi State University for his paper "Behavior of sex chromosomes, autosomes and the spindle during nonrandom segregation in a flea beetle" co-authored with Holly Kupfer, *ASB Bul. Abstr.* 213, 47(2).

ASB STUDENT RESEARCH AWARD

The ASB Student Research Award supported by the Martin Microscope Co. of Easley, SC, was presented by Lew Stratton to Gordon Plague of the Savannah River Ecology Laboratory in Aiken, SC, for his paper "Distinct behavioral phenotypes in *Macrostemum carolina*: intrapopulation polymorphism or fixed strategies within different populations" co-authored with J. Vaun McArthur, *ASB Bul. Abstr.* 214, 47(2).

ASB STUDENT RESEARCH AWARD IN AQUATIC BIOLOGY

The ASB Student Research Award in Aquatic Biology sponsored by Wildco (Wildlife Supply Company) was presented by Lew Stratton to Rebecca Souther of Southeastern Louisiana University for her paper "The effects of submergence, light, fertilization, and salinity on newly germinated bald cypress (*Taxodium distichum* (L.) Richard) seedlings" co-authored with Gary Shaffer, *ASB Bul. Abstr.* 300, 47(2).

Dwayne Wise receives the Faculty Outstanding Paper Award from Walter Diehl.

EUGENE P. ODUM AWARD

The Eugene P. Odum Award this year was shared by two students. Each received a plaque and $250. The awards were presented by Ken Marion to Ken Fortino of Appalachian State University for his paper "Crayfish distributions and predatory fish: is there a connection?" co-authored with Robert Creed, *ASB Bul. Abstr.* 142, 47(2); and to Karen Geissinger of Appalachian State University for her paper "Grazing influences on species diversity and net primary production in a southern Appalachian wet meadow" co-authored with Howard Neufeld and Robert Sutter, *ASB Bul. Abstr.* 314, 47(2).

THE NORTH CAROLINA BOTANICAL GARDEN AWARD

The North Carolina Botanical Garden Award was presented by Howard Neufeld to Philip Sheridan of Old Dominion University for his paper "Inbreeding, outbreeding, and heterosis in the yellow pitcher plant, *Sarracenia flava* (Sarraceniaceae), in Virginia" co-authored with David Karowe, *ASB Bul. Abstr.* 296, 47(2).

Ken Fortino and Karen Geissinger receive the Eugene P. Odum Award from Ken Marion (center).

ASB POSTER AWARD

The ASB Poster Award was presented by John Aho to Heather Lindfors, Sean Westmoreland, Matt Rowe, and J. Kenneth Shull of Appalachian State University for their poster "Alteration of female mating preference in female *Drosophila melanogaster*," *ASB Bul. Abstr.* 46, 47(2).

SE DIVISION OF AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS AWARD

The Southeastern Division of ASIH Award was presented by the Society's Division President Steve Layman for Ichthyology to Matthew Thomas of Eastern Kentucky University for his paper "Morphological differentiation of the northern madtom, *Noturus stigmosus*, and the mountain madtom, *Noturus eleutherus*" co-authored with Patrick Ceas, *ASB Bul. Abstr.* 152, 47(2); and for Herpetology to Eric Blackwell of University of Alabama at Birmingham for his paper "Population size estimate for a southern population of the spotted salamander, *Ambystoma maculatum*" co-authored with Ken Marion and George Cline, *ASB Bul. Abstr.* 177, 47(2). President Layman was also pleased to report that the following seven students presenting a paper or a poster at the annual meeting were awarded travel grants:

Andrew Longenecker, Marshall University (herpetology)
Jayme Waldron, Marshall University (herpetology)
Cara Hoar, Mary Washington College (ichthyology)
Kyle Piller, Tulane University (ichthyology)
Steve Powers, University of Alabama (ichthyology)
Matthew Thomas, Eastern Kentucky University (ichthyology)
Jason Tipton, Tulane University (ichthyology)

Philip Sheridan (left) receives the NC Botanical Garden Award from Howard Neufeld.

ELIZABETH ANN BARTHOLOMEW SERVICE AWARD

The Elizabeth Ann Bartholomew Service Award is presented to individuals who have distinguished themselves in professional and public service that advances our knowledge and appreciation of the world of plants and their scientific, cultural, and aesthetic values. The 2000 award was presented by Donald Drapalik of Georgia Southern University to C. Ritchie Bell who is a retired Professor of Botany of the University of North Carolina at Chapel Hill.

GIBBS AWARD FROM THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS FOR EXCELLENCE IN SYSTEMATIC ICHTHYOLOGY

The award for 2000 was presented to Dr. James C. Tyler, Senior Scientist, National Museum of Natural History, Smithsonian Institution, for his outstanding contributions on plectognath fishes, as well as his papers on several other groups of fishes, both recent and fossil.

Matthew Thomas (right) receives the Ichthyology Award from Steve Layman.

THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS TREASURER'S REPORT 1 JANUARY–31 DECEMBER 1999

I.	**BEGINNING BALANCE**			**$72,920**
II.	**RECEIPTS**			
	Regular Dues		7,930	
	Patron Dues		1,000	
	Meeting Revenue		2,655	
	Enrichment Fund		1,125	
	Sales		0	
	Interest		4,166	
	Royalties		102	
	Society of Wetland Scientists, South Atlantic Chapter		0	
	Carolina Biological Supply Co., Teaching Award		1,000	
	WILDCO Aquatic Biology Award		0	
	TOTAL RECEIPTS			**$17,978**
III.	**TOTAL RECEIPTS AND BEGINNING BALANCE**			**$90,898**
IV.	**DISBURSEMENTS**			
	1. Publication			
	ASB Bulletin 45(4) & 46(1)	4,391		
	ASB Bulletin 46(2)	8,396		
	Total Publications		12,787	
	2. Official Travel		49	
	3. Awards and Honoraria			
	Graduate Student Support Grants	4,000		
	Speaker Honorarium	1,000		
	Speaker Travel	977		
	WILDCO Aquatic Biology Award	200		
	ASB Research Awards	1,200		
	Certificates/Plaques	145		
	ASB Poster Award	300		
	Carolina Biological Teaching Award	1,000		
	Outstanding Science Teachers	984		
	Total Awards		9,806	
	4. Miscellaneous			
	Affiliation (AIBS & ASC)	200		
	Symposia			
	Education	198		
	Women, Minorities, & Disabled	366		
	Other	500		
	Mississippi University for Women	90		
	Bank Charges	261		
	Total Miscellaneous		1,615	
	TOTAL DISBURSEMENTS			**$24,701**
V.	**ENDING BALANCE**			**$66,197**
VI.	**NET CHANGE FOR 1999**			**($6,723)**

ASSOCIATION OF SOUTHEASTERN BIOLOGISTS
ENRICHMENT FUND 1 JANUARY – 31 DECEMBER 1999

I.	**BEGINNING BALANCE**			**$29,454**
II.	**RECEIPTS**			
	1. Gifts	1,125		
	2. Interest	1,208		
	TOTAL RECEIPTS		**2,333**	
III.	**TOTAL RECEIPTS AND BEGINNING BALANCE**			**$31,787**
IV.	**TOTAL DISBURSEMENTS**			**0**
V.	**ENDING BALANCE**			**$31,787**
VI.	**NET CHANGE FOR 1999**			**$2,333**

CASH ON HAND
31 DECEMBER 1999

I.	**MERRILL LYNCH**	**$79,658**
II.	**WACHOVIA**	**$11,229**
	TOTAL	**$90,887**

ASB MEMBERSHIP COUNT BY STATUS IN 1999

CONTRIBUTING	15
EMERITUS	56
FAMILY	32
LIBRARY	53
PATRON	5
REGULAR	638
STUDENT	240
SUSTAINING	2
	1041

ASSOCIATION OF SOUTHEASTERN BIOLOGISTS
BUDGET 2000 ON 5 APRIL 2000

		Budget	Actual	Difference
I.	**RECEIPTS**			
	Regular Dues	17,050	1,855	(15,195)
	Patron Dues	2,000	1,000	(1,000)
	Interest	1,500	1,057	(443)
	Meeting Revenue:			
	Exhibits	3,000	0	(3,000)
	Sales	250	0	(250)
	Registration	7,400	0	(7,400)
	Carolina Biological Supply Company			
	Teaching Award	1,000	1,000	0
	Society of Wetland Scientists,			
	South Atlantic Chapter	500	500	0
	Enrichment	0		
	Carolina Biological Contribution	0	3,600	3,600
	TOTAL RECEIPTS	**$32,700**	**$9,012**	**($23,688)**
II.	**DISBURSEMENTS**			
	1. Dues Notice	500	0	500
	2. Publications			
	ASB Bulletin 46(3)	0	3,323	(3,323)
	ASB Bulletin 46(4)	0	4,005	(4,005)
	ASB Bulletin 47(1)	3,000	1,627	1,373
	ASB Bulletin 47(2)	8,000	0	8,000
	ASB Bulletin 47(3)	3,500	0	3,500
	ASB Bulletin 47(4)	3,000	0	3,000
	Misc. Publications	500	147	353
	3. Office Expenses	500	0	500
	4. Official Travel	1,500	464	1,036
	5. Awards and Honoraria			
	Grad. Student Support Grants	4,100	4,116	(16)
	Aquatic Biology Award	200	0	200
	Speaker Honorarium	1,000	0	1,000
	Speaker Travel	1,000	0	1,000
	Research Awards	1,200	0	1,200
	Certificates/Plaques	300	0	300
	Poster Award	300	0	300
	Carolina Biol. Teaching Award	1,000	0	1,000
	6. Interim Meeting	0	462	(462)
	7. Miscellaneous			
	Affiliations	400	200	200
	Local Committee	500	0	500
	Symposia, Workshops	1,900	0	1,900
	Bank Charges	200	20	180
	Web Site	100	0	100
	NSF 50th Anniversary	0	50	(50)
	TOTAL DISBURSEMENTS	**$32,700**	**$14,414**	**$18,286**
III.	**BALANCE**	**$0**	**($5,402)**	**($5,402)**

ASSOCIATION OF SOUTHEASTERN BIOLOGISTS
Proposed Budget 2001

I.	**BEGINNING BALANCE**	**(ASSUME)**		**$50,000**
II.	**RECEIPTS**			
	Regular Dues		18,000	
	Patron Dues		2,500	
	Interest		4,000	
	Meeting Revenue: Exhibits		5,000	
	Carolina Biological Supply Co. Teaching Award		1,500	
	WILDCO Aquatic Biology Award(?)		0	
	TOTAL RECEIPTS			**$31,000**
III.	**TOTAL RECEIPTS AND BEGINNING BALANCE**			**$81,000**
IV.	**DISBURSEMENTS**			
	1. Dues Notice		0	
	2. Publication			
	ASB Bulletin 48(1)	3,000		
	ASB Bulletin 48(2)	8,000		
	ASB Bulletin 48(3)	3,500		
	ASB Bulletin 48(4)	3,000		
	Total Publication		17,500	
	3. Office Expenses		300	
	4. Official Travel		1,500	
	5. Awards and Honoraria			
	Graduate Student Support	4,500		
	Aquatic Biology Award(?)	200		
	Speaker Honorarium	1,000		
	Speaker Travel	1,000		
	Research Awards	1,200		
	Certificates/Plaques	300		
	Poster Award	300		
	Carolina Biol. Teaching Award	1,500		
	Total Awards and Honoraria		10,000	
	6. Interim Meeting (New Orleans)		500	
	7. Miscellaneous			
	Affiliations	200		
	Local Committee	500		
	Symposia, Workshops	2,000		
	Bank Charges	250		
	Total Miscellaneous		2,950	
	TOTAL DISBURSEMENTS			**$32,750**
V.	**NET BALANCE FOR YEAR**			**($1,750)**
VI.	**ENDING BALANCE**			**$48,250**

ASB Officers, Committees and Representatives and *ASB Bulletin* Staff, 2000-2001

Telephone numbers, FAX numbers and e-mail addresses can be found on the inside front cover of each issue of the *ASB Bulletin*.

ASB Bulletin Staff

Print Editor	James D. Caponetti, Department of Botany, University of Tennessee, Knoxville, TN
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Bonnie Kelley, Department of Biology, University of North Carolina, Pembroke, NC

2003: Henry Bart, Tulane Museum of Natural History, Belle Chasse, LA
Kim Marie Tolson, Department of Biology, University of Louisiana, Monroe, LA

ASB Committees 2000-2001

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Place of Meeting Committee

Chair 2000: Kim Tolson, Biology Department, Northeast Louisiana University, Monroe, LA 71209, (318) 342-1805, FAX (318) 342-1755, bitolson@alpha.nlu.edu;
Membert: Robert George, Biological Sciences, 601 South College Road, University of North Carolina at Wilmington, Wilmington, NC 28403-3297, (910) 962-3487, FAX (910) 962-4066, georger@uncwil.edu.
Member: Mark Schorr, Department of Biological and Environmental Sciences, University of Tennessee at Chattanooga, 615 McCallie Avenue, Chattanooga, TN 37403-2598, (423) 755-4149, FAX (423) 785-2285, mark-schorr@utc.edu.

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Member: Mark Schorr, Department of Biological and Environmental Sciences, University of Tennessee at Chattanooga, 615 McCallie Avenue, Chattanooga, TN 37403-2598, (423) 755-4149, FAX (423) 785-2285, mark-schorr@utc.edu.

Past Presidents Eloise Carter and Pat Parr.

Special Opportunity

The University of Tennessee at Knoxville announces an NSF-sponsored research site for educators in chemistry

With support from the National Science Foundation, the University of Tennessee offers sabbatical fellowships for faculty in chemistry, biology, and other environmentally related fields at primarily undergraduate institutions (PUIs) in the U.S., aimed at enhancing both research and teaching in chemical and environmental analysis at Fellows' home institutions. Appointments include teaching/research semesters at UT and at a research-active "partners" PUI; plus one or two summers in full-time research (at UT, the partner school, or an industrial laboratory). Students from the Fellow's home institution can become involved through parallel undergraduate research programs at UT and Oak Ridge National Laboratory. Applications will usually be reviewed in February and August and should be received by January 15 or July 15 for timely consideration. Details about the program, including an online application form, are available at http://www.chem.utk.edu/~rsec/, or by contacting the RSEC Program Director: Dr. Kelsey D. Cook, Department of Chemistry, The University of Tennessee, Knoxville, TN 37996-1600 (rsec@utk.edu, phone (865) 974-8019).

Special Event

Piedmont Ecology & Conservation Symposium 2000 November 9-11, 2000

Co-sponsored by Daniel Stowe Botanical Garden, Belmont, NC, and Schiele Museum of Natural History & Planetarium, Gastonia, NC.

PURPOSE of the Symposium:

- Bring together researchers, educators and conservationists with knowledge of and concern for Piedmont ecosystems.
- Facilitate the dissemination of scientific knowledge and information about conservation issues relevant to the Piedmont.
- Establish a forum for individuals and organizations with interests in the Piedmont.
- Promote collaborative studies among researchers and regional institutions.

Keynote Speaker: Dr. William Schlesinger, Professor of Botany at Duke University and principal investigator for the Free Carbon Dioxide Enrichment (FACE) experiment in the Duke Forest, will present a keynote address on Friday, November 10.

Papers and Posters: Three paper sessions and a poster session will be provided.

For further information, visit http://www.stowegarden.org/piedmont.htm, our information web page.

To communicate with our symposium coordinator, contact Don Rhoades by phone (704) 829-1257, e-mail rhoades@stowegarden.org or FAX (704) 829-1240.

2001 MEETING OF THE ASSOCIATION

CALL FOR PAPERS

THE 62ND ANNUAL MEETING

HOSTS: TULANE UNIVERSITY AND

LOYOLA UNIVERSITY NEW ORLEANS

MEETING SITE: NEW ORLEANS, LA

DATE: 4-7 APRIL 2001

Please note the following deadlines which are to be met before our 62nd Annual Meeting hosted by the Tulane University and Loyola University New Orleans.

17 November Titles and abstracts of papers and posters (use electronic submission format described below). They must reach the program chairman by this date.

15 October Nominations for ASB officers and executive committee.

15 November-
5 January Submissions for research awards.

5 January Application for student travel awards.

MEETING WEBSITE

Meeting Website is – **www.loyno.edu/~asb**

(note that "l" in loyno is a letter, as in Loyola)

PAPER & POSTER SUBMISSION DOCUMENTS FOR 2001 MEETING DEADLINE: 17 November 2000

Individuals presenting papers or posters are expected to be members of ASB!

INSTRUCTIONS FOR SUBMITTING ABSTRACTS

Submit the following information and your abstract via e-mail to **asb@loyno.edu**. The information in items 1 to 9 below and the abstract should be submitted as two separate attachments to a single e-mail message. If you do not have access to e-mail or software capable of sending files as attachments, contact Dr. Craig S. Hood (see below). The file should be created in Microsoft Word (either Mac or Windows versions). If you do not have access to Microsoft Word, WordPerfect is acceptable. Information and abstracts must be received no later than 17 November 2001 for the title to appear on the program and the abstract to be published in the April 2001 issue of *Southeastern Biology*. In the event of a last-minute cancellation or other problem, notify the Program Co-Chairman, Dr. Craig S. Hood, Department of Biological Sciences, Loyola University, New Orleans, LA 70118, e-mail: chood@loyno.edu, phone: (504) 865-2193.

Please type the following information concerning your presentation and send it as an attached file to an e-mail message; **an electronic copy is available for downloading at the meeting website – www.loyno.edu/~asb**. Provide the phone/fax numbers and e-mail address for the primary author. If you are submitting on behalf of another person, make sure you clearly indicate contact information for the primary author.

1. **AUTHOR(s):**

2. **INSTITUTION(s):**

3. **1st AUTHOR PHONE / FAX:**

4. **1st AUTHOR E-MAIL:**

5. **TITLE:**

6. **PRESENTATION**: Paper_____ Poster_____

7. **PROJECTION EQUIPMENT**: 35 mm slides____
   Overhead____
   Other (specify): _____

Due to prohibitive costs, data projectors cannot be provided. Time limit for presentations and questions is 15 minutes. Plan on speaking for 10-12 minutes to leave time for questions.

8. **RECOMMENDED SECTION:** Check appropriate section(s) to which your paper/poster should be assigned. If you check more than one, rank sections as to your preference (with "1" being first preferred). Paper sections will be established based on needs. Posters will be grouped by subject area.

_____ Animal physiology
_____ Aquatic, wetland & marine ecology
_____ Developmental biology
_____ Genetics, cell & molecular biology
_____ Herpetology
_____ Ichthyology
_____ Invertebrate zoology & entomology
_____ Mammalogy
_____ Microbiology
_____ Ornithology
_____ Parasitology
_____ Plant ecology
_____ Plant physiology
_____ Plant Systematics
_____ Teaching biology

9. **AWARDS:** If you intend to apply for one of the following awards, please indicate this below, so the Program Committee can schedule talks appropriately. See this issue of *The ASB Bulletin* for specific application instructions (including contact persons and addresses). All posters will automatically be considered for the Poster Award ($300).

__ ASB Student Research Award ($600)
__ ASB Faculty Research Award ($600)
__ Odum Award ($250)
__ Aquatic Biology Student Award ($200)
__ NC Botanical Garden Award ($100)
__ SEASIH Ichthyology Award ($100)
__ SEASIH Herpetology Award ($100)
__ ASIH Gibbs Memorial Award ($7,500)

ABSTRACT REQUIREMENTS

PLEASE FOLLOW THESE FORMATING INSTRUCTIONS EXACTLY, OR YOUR ABSTRACT WILL BE RETURNED TO YOU FOR REVISION. IF IT IS RESUBMITTED AFTER THE DEADLINE, THE ABSTRACT WILL NOT APPEAR IN *SOUTHEASTERN BIOLOGY* IN THE APRIL 2001 ISSUE.

ABSTRACT: Please send the abstract as an attached file to an e-mail message to the following address: **asb@loyno.edu**. Do not paste the abstract into the body of an e-mail message. The file must be in 12 point Times New Roman, with margins of 1 inch right and 2½ inches left. Do not place hard returns at ends of lines; allow word-wrapping. The abstract must not exceed 200 words. Directions for formatting the abstract are given below and at the meeting web site: **www.loyno.edu/~asb**. If you have any additional questions, you may contact the Program Co-Chair,

Dr. Craig S. Hood, e-mail: chood@loyno.edu; phone: (504) 865-2193; fax: (504) 865-2920.

1. Indent author, institution, and title information 1 tab stop (½ inch). Type in the following order: AUTHOR'S NAME(S) all capitalized; last name first for first author; other authors' names (if any), first names first. If two authors, separate names with "AND". In the case of more than two authors, separate all but last name with a comma and separate the last two with ", AND". End with a period.

2. Institution(s) follow authors' names directly. Maintain the same indentation as names and end with a dash(–). In the case of two or more authors from different institutions, place all author names together first, followed by all institutions in the same order. If necessary, key the authors' names to the institutions by a superscript number. See example below or on the website.

3. Start the title immediately after the dash without a space. Capitalize first letter of first word then only proper and scientific names as customary. Underline all of the title, and maintain the same indentation as name and institution. End with a period. Leave two full lines between title and abstract text.

4. Start text of abstract on a new line. Do not indent first line. Use one paragraph for entire text. Do not put any reference citations in the abstract. Justify both left and right margins for best appearance.

5. Single space all typing. Put all taxonomic names in *italics*.

6. If a grant source is acknowledged, place at end of text without a new paragraph.

EXAMPLES

PILLER, KYLE R. Tulane Museum of Natural History, Belle Chasse, LA 70037–Molecular systematics of the *Etheostoma blennioides* complex (Teleostomi: Percidae).

The greenside darter, *Etheostoma blennioides*, is a wide-ranging polytypic taxon that is comprised of four subspecies (*E. b. blennioides*, *E. b. newmanii*, *E. b. gutselli*, *and E. b. pholidotum*) and several races. Sequence data from the mitochondrially encoded cytochrome-b gene was used to evaluate the diversity and to to estimate the intraspecific phylogeny of the *E. blennioides* complex....

JOPLIN, KARL H.[1], RONALD D. FLANNAGAN[2], AND DAVID DENLINGER[2]. [1]Dept. Biological Sciences, East Tennessee State University, Johnson City, TN 37614 and [2]Dept. Entomology, Ohio State University, Columbus, OH 43210– Cloning of diapause specific genes of the flesh fly, *Sarcophaga crassipalpis*.

Insects in temperate climates use diapause as an overwintering strategy. This developmental state is signaled by environmental cues... .

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7. **NOTE:** The program will be posted on the meeting website **www.loyno.edu/~asb** prior to the meeting. You can check there to see the day and time of your presentation.

8. **Reprints** of abstracts are not available. You may duplicate the printed abstracts from *Southeastern Biology*.

9. **Important:** In case of error in your name or title or questions about your presentation, please notify the Program Co-Chair, Dr. Craig Hood as soon as possible.

ASB 2001 FIELD TRIPS
NEW ORLEANS, LOUISIANA

Plan on signing up for one of the field trips scheduled for the meetings in New Orleans. These won't be ordinary trips - they can't be, otherwise few would be lured away from the attractions of the city! As of now, eight different trips are planned, led by local experts, many involving travel by boat (after all, you really can't experience wetlands fully without getting off the road), and the others to special local natural areas. Here is the current list of trips:

1. **Honey Island Swamp** within the basin of the Pearl River; boat tour of amazing local culture and isolated White Kitchen Nature Conservancy property, including alligators.
2. **Tunica Hills** and **Clark Creek Natural Area**, most southwestern refugial area for Appalachian flora and fauna.
3. **Crosby Arboretum**'s huge bog and longleaf pine savanna; incredible pitcher-plant, sundew and orchid diversity.
4. **Manchac Swamp** and **Shell Bank Bayou** canoe trip; alligators and calling frogs.
5. **Grand Isle** birding on beaches, salt marshes and cheniers; especially for migrants; potentially dozens of warblers and scenic views of cajun fishing villages.

6. **Jean Lafitte National Historical Park**'s diverse wetlands including floating marshes along scenic boardwalks.
7. **LUMCON** marine field station saline marshes and barrier islands boat tour; with information on wetland restoration.
8. **Mississippi River delta** boat tour; 30 minutes down river from nearest road into vast wetlands to see birds, new land building, 1000's hectares of *Phragmites*, and the big ships passing Pilottown

A couple of half-day trips will be scheduled on Wednesday afternoon before the meeting and the remaining trips will be scheduled on Saturday after the meeting. The trips will return by early evening so participants have sufficient time to enjoy our great city. Costs will be about $40.00 for the trips by boat and somewhat less for the others. Springtime is a great time to see the natural world in the region around New Orleans. Don't miss the opportunity and remember to **register early next year** to be assured of space on one of these trips! From the land of alligators, lagniappe, neutral grounds, coypu, andouille, Mardi Gras, streetcars, jambalaya, crawfish pie, the Quarter, and po' boys. . . . see you!

David A. White; dawhite@loyno.edu, for inquiries.

See the meeting website -- **www.loyno.edu/~asb** -- for updates and descriptions of the field trips

Guidelines for Poster Session and ASB Poster Award ($300)

Poster sessions have been incorporated as a regular means of scientific presentation at the annual ASB meetings. This type of presentation provides a more informal environment that encourages a direct interchange of ideas and discussion between presenter and audience. In order to stimulate greater use of posters as an effective means of presenting research results, ASB awards a $300 cash prize to the best poster presentation. All posters will automatically be entered in a judging for the Poster Award. Adherence to the following guidelines will help ensure the effectiveness of the poster presentation and consideration for the award.

(a) Posters must fit in an area 8 feet wide and 4 feet high. Presenters must provide their own pins to attach posters to poster boards.
(b) Posters must be displayed from 10:00 a.m. Thursday through 5:00 p.m. Friday. Authors will be required to be present at specified times during the annual meeting.
(c) Posters should be carefully planned to maximize clarity and simplicity in conveying information.
(d) Posters should have a heading including a title, author, and author's institution(s). This heading should be placed at the top in letters no less than 3 cm high.
(e) The body of the poster, including text, figure legends and table captions, should be in type no smaller than 18 pt (3-4 mm) and *must* be legible from a distance of about 1-2 meters.
(f) The body should be self-explanatory and should include figures, tables, graphs, maps, or photographs displayed in a well organized, coherent, and easy-to-follow sequence from top to bottom. Each illustration should contain a caption. *Do not over crowd the display*.
(g) A limited degree of text may be included, but care should be taken not to overwhelm the audience.
(h) A large, abbreviated version of the abstract should be presented at the top of the poster, but below the heading. A clear listing of specific conclusions should appear at the bottom or end of the presentation.
(i) In addition to adherence to the above-listed guidelines, poster presentations will also be judged using the following specific criteria:
    (i) overall aesthetics and attractiveness of presentation.
    (ii) ease of reading from a distance (1-2 meters).
    (iii) clear and concise organization.
    (iv) clearly stated hypothesis.
    (v) soundness of methods for testing hypothesis.
    (vi) how well conclusions are supported by results.

Further inquiries may be directed to the chair of the ASB Poster Award Committee: Dr. George Cline, Biology Department, Jacksonville State University, 700 Pelham Road North, Jacksonville, AL 36265-1602, (256) 782-5798, gcline@jsucc.jsu.edu.

NOMINATION FOR ASB OFFICERS AND EXECUTIVE COMMITTEE POSITIONS

DEADLINE: 15 OCTOBER 2000

To members of the Nominating Committee: I wish to suggest that you consider the following ASB member(s) in selecting nominees for officers and executive committee positions. (Please include the institutional address of each nominee.)

_____

PRESIDENT-ELECT _____

_____

VICE-PRESIDENT _____

_____

EXECUTIVE COMMITTEE
(two will be elected for three-year terms)

_____

_____

_____

_____

_____

MAIL TO: Dr. Eloise Carter, Department of Biology, Emory at Oxford College, Oxford, GA 30267, (707) 784-8343, ecarter@emory.edu.

_____

NAME & ADDRESS OF NOMINATOR _____

_____

_____

_____

_____

"TRAVEL" SUPPORT AWARDS FOR GRADUATE STUDENT MEMBERS OF ASB

DEADLINE: 5 JANUARY 2001

Limited funds are available to partially defray the expenses of graduate students attending the Annual Meeting. The awards are for lodging and meals only. Departments are urged to provide transportation for their graduate students. *Recipients must be members of ASB.* The guidelines for application are as follows:

(a) *The recipient is a current member of ASB.*

(b) The recipient must be presenting a paper or poster at the Annual Meeting and must include a separate copy of the abstract of the paper or poster to be presented along with the application.

(c) The recipient must be currently enrolled as a graduate student in the department where he/she conducted this research.

(d) Give a conservative, itemized estimate of meeting expenses including transportation. Student travel awards are granted on a competitive basis. Applicants must document expected expenses and list other sources of financial support for this meeting, including institutional aid, shared lodging and shared transportation.

(e) In a paragraph, give a brief history of your education to date: indicated how many years you have been in graduate school and the expected date of completion of work for your degree, your major field of study and research, publications including those in press and in preparation, degree sought, name of major professor and any other pertinent details.

(f) Give your source(s) of support while in graduate school: e.g. NSF, NIH, USDA, Teaching Asst., Research Asst., etc.

(g) Include a letter of recommendation for an ASB support award from your faculty research advisor. This letter should comment on the work being presented and indicate the financial need of the student presenter. It should also indicate whether any departmental or other funding is available to the student.

(h) Send application, with supporting letter, all in triplicate, to: Dean Cocking, Department of Biology, James Madison University, Harrisonburg, VA 22807, (540) 568-6566.

(i) Applicants will be notified of the decision of the Committee as soon as is practical. Recipients of the award will receive their checks at the meeting.

Research Awards

ASB Student Research Award ($600) and ASB Senior Research Award ($600)

Given for an especially meritorious manuscript presented orally by the author(s) at the Annual Meeting. In order to qualify for presenting the paper, the author(s) must submit an abstract by the November deadline. Papers submitted for the competition must be received in triplicate and in their entirety by the January deadline and must be journal-ready manuscripts worthy of publication. The student award (sponsored by Martin Microscope Company) is given to the senior author if she/he is a graduate or undergraduate student at the time of presentation. To qualify, author(s) must submit an abstract, title form, and application for the award by 15 November 2000; and four copies of the journal-ready manuscript with abstract, title form, and short biographical sketches of each author by 5 January 2001. Only ASB members are eligible. Judges will use a standard evaluation form that includes the following criteria: significance of ideas, soundness of hypotheses, originally (creativity), quality of methodology, validity of results, soundness of conclusions, clarity, completeness, organization, and contribution to the field. At the discretion of the Research Award Committees, the award may be withheld or it may be split in the case of a tie. Papers may be in press, but not published prior to the previous annual meeting.

Committee Chairs:

Faculty–Thomas Wentworth, Campus Box 7612, North Carolina State University, Raleigh, NC 27695-7612, (919) 515-2168, FAX (919) 515-3436, tom_wentworth@ncsu.edu.

Student–Scott Franklin, University of Memphis, Memphis, TN 38152-6081, (901) 678-5539, FAX (901) 678-4746, sfrankli@memphis.edu.

ASB Student Research Award In Aquatic Biology ($200)

Sponsored by Wildlife Supply Company (WILDCO), the purpose of the award is to encourage excellence in aquatic biology research by undergraduate and graduate students. Students who are members of ASB and whose work is sponsored by a professional biologist who is also an ASB member are eligible. The paper must be based on research designed and completed by the student and it must be presented orally by the student as senior author at the Annual Meeting. To be eligible, author(s) must submit an abstract, title form, and application for the award by 15 November 2000, four copies of the journal-ready manuscript with abstract, title form, and short biographical sketches of each author by 5 January 2001 and a letter from the sponsor affirming student status at the time the research was completed and sponsorship of the student to the chair of the Student Research Award Committee. Judges will use a standard evaluation form that includes the following criteria: significance of ideas, soundness of hypotheses, originality (creativity), quality of methodology, validity of results, soundness of conclusions, clarity, completeness, organization, and contribution to the field. At the discretion of the Student Research Award Committee, the award may be withheld or it may be split in the case of a tie. It is intended that aquatic biology be broadly interpreted. For

example, research projects on aquatic organisms, wetland biota, and water quality are all eligible. Committee Chair: Scott Franklin, University of Memphis, Memphis, TN 38152-6081, (901) 678-5539, FAX (901) 678-4746, sfrankli@memphis.edu.

Eugene P. Odum Award ($500)

Given by the Southeastern Chapter of the Ecological Society of America for the best ecological paper presented by a student. Undergraduate and graduate students are eligible and the student must be the sole or senior author. The paper must deal with a clearly ecological topic and should be presented in any of the following sessions: Aquatic Ecology, Plant Ecology, or Animal Ecology. One copy of the title and abstract should be sent to the Program Chair by November 15, and a second copy to Dr. Ken Marion, Biology Department, University of Alabama at Birmingham, Birmingham, AL 35294; (205) 934-3582; kmarion@uab.edu.

The North Carolina Botanical Garden Award ($100)

Given by NCBG (through the Southeastern Section of the Botanical Society of America and the Southern Appalachian Botanical Society). This is awarded for a paper presented at the annual ASB meetings that best advances our understanding of the biology and conservation of the southeastern plants and thus contributes to the mission of the North Carolina Botanical Garden. Of special interest to the Garden are the rare plant species of the Southeast: why they are rare; how they interact with plants, animals, and their environment; and what can be done to ensure their survival. The paper may deal with a broad area including systematics, ecology and conservation. All individuals who are eligible to present at the ASB meetings are eligible for this award. They may be students, faculty or others.
Awards Committee Chair: Dr. John Randall, Department of Biology, University of North Carolina, Greensboro, NC 27412.

Travel Support Awards for Student Members of the Southeastern Division, American Society of Ichthyologists and Herpetologists

Travel grants of $50 each are available to a limited number of student members of SEASIH to attend the ASB annual meeting being hosted by Tulane and Loyola Universities on 4-7 April 2001. Applicants must be presenting a paper or poster at the meeting. Students seeking travel awards should provide a brief justification for their request and an abstract of their paper/poster by 5 January 2001. Recipients must be present at the SEASIH business meeting to pick up their award.

Southeastern Division, American Society of Ichthyologists and Herpetologists Outstanding Student Paper Awards Ichthyology ($100); Herpetology ($100)

Students who are sole or senior authors on papers, and who are members of SEASIH may compete for this award in one of these two subject areas. To be

considered, submit a copy of the abstract that was submitted to ASB to the SEASIH President at the address below by 5 January 2001. The student paper awards are presented at the ASB banquet. Send applications for both awards to: Dr. Debbie Moore, Troy State University Dothan, P. O. Box 8368, Dothan, AL 36304.

Gibbs Award from the American Society of Ichthyologists and Herpetologists for Excellence in Systematic Ichthyology

Nominations are invited for the American Society of Ichthyologists and Herpetologists (ASIH) Robert H. Gibbs, Jr., Memorial Award for Excellence in Systematic Ichthyology.

The prize is awarded for an outstanding body of published work in systematic ichthyology to a citizen of a Western Hemisphere nation who has not been a recipient of the award. The award is offered annually and consists of an appropriate plaque and a cash award (approximately $7500). The award recipient is announced at the annual meeting of the American Society of Ichthyologists and Herpetologists.

Nominations may be made by any ichthyologist, including self-nominations, and should include the nominee's curriculum vitae, details of the nominee's specific contributions and their impacts on systematic ichthyology. Nominations should be submitted by March 1, 2001, in order for the nominee to be eligible for that year's award. Nominations will be effective for three award periods (2001-2003). Four copies of each nomination should be sent to Dr. Maureen A. Donnelly, Department of Biological Sciences, Florida International University, 300 NE 151st St., North Miami, FL 33181-3000.

HONOR THY TEACHER!

ASB MERITORIOUS TEACHING AWARD: DEADLINE JANUARY 15, 2001

Each year the ASB recognizes one of its members for especially meritorious teaching. Carolina Biological Supply Company, Burlington, NC, has generously sponsored this $1500 award, which will be presented together with an appropriate citation at the Annual Banquet in New Orleans in April 2001.

Nominees must be members of ASB who are actively engaged in, or recently retired from, the teaching of biology in any southeastern college or university. Successful candidates typically have been teaching for at least 10 years, but there are no restrictions on size of the institution, presence of graduate program, etc. The Award simply is for highly effective teaching. There are many deserving members of ASB. However, they cannot nominate themselves, so former students or colleagues must take an active role in assembling the materials that the Committee then will evaluate.

Take the lead, pass the word–serve as the coordinator and nominate a deserving teacher! Solicit supporting letters from the nominee's present and former students. Contact his or her colleagues for additional endorsements. Be sure to include any form of recognition by the nominee's home institution of excellence in teaching, or special assignments or mentoring roles facilitating good teaching. Of special note would be the number and quality of students for whom the nominee provided primary inspiration to continue in biology, especially for students who subsequently earned advanced degrees. In short, document the educational impact this individual has made by virtue of his or her role as a biology professor.

Nominators should send a current *curriculum vitae* and all relevant documents, together with the Nomination Form for the Meritorious Teaching Award, to: Dr. Stewart Ware, Department of Biology, College of William and Mary, Williamsburg, VA 23187-8795, (757) 221-2233, FAX (757) 221-6483, saware@um.edu. Submit all materials in triplicate by the January 15 due date. If you have any questions, please call me or send e-mail. Previously nominated candidates who did not receive the award may be re-nominated, with updated supporting materials. The Committee would welcome the task of deciding among several candidates.

Thanks for taking this initiative.

Stewart Ware, Chair
Meritorious Teaching Award Committee

NOMINATION–ASB MERITORIOUS TEACHING AWARD, 2001

NAME: _____

ADDRESS: _____

_____

_____

TEACHING INTEREST:

_____

NOMINATOR NAME/ADDRESS: _____

_____

_____

SUPPORTING DOCUMENTATION: Letter of nomination _____

(enclosed, in triplicate _____) Supporting letters _____

Curriculum Vitae _____ Additional Information (list) _____

REVIEWS

James Ross, Review Editor
7196 College Station Dr., Cumberland College
Williamsburg, KY 40769-1382

Hemmerly, T. E. 2000. **Appalachian Wildflowers**. The University of Georgia Press. Athens, GA. $22.95 paper. 327 p.

This field guide features photographs of 378 of the more common wildflowers in the Appalachian region and provides enough information that more than 800 species can be identified using the text. The book uses a color plate identification technique.

While the majority of the opening chapters is interesting, well written, and purposeful, some parts lack organization or content. In Chapter 1, the section on "Plate Tectonics" is unnecessary, and I wondered why it was included. It did not add anything to the next section which discussed the formation of the Appalachian Mountains. On the other hand, I thoroughly enjoyed the bits regarding the early explorers in this region. Such aspects are often neglected in other texts of this type. Reference to the figure on the Appalachian Mountains should have been included in the "The Appalachians Today" section or somewhere within Chapter 1. Chapter 2 seems inadequate. I felt the author realized the magnitude of what should be said and just chose to do a very quick overview, thereby weakening the entire discussion. The content of this chapter could have been woven into Chapters 3-5 which provide a good summary of Appalachian environments.

The section on "Using the Color Plates," which is supposed to guide users through the identification process, comes about 40 pages into the text and then refers them back to earlier pages. Some defining terms are given here, instead of being more logically placed in Chapter 6 which gives a quick overview of some phytographical terms. Chapter 6 falls short on providing an adequate introduction to phytography. A discussion of leaves consists of a single sentence and then refers the reader to illustrations with no other explanations. No consideration is given to underground parts or fruits.

The bulk of the text is devoted to color photographs of wildflowers and their descriptions. While the flowers are generally well photographed, many do not clearly show the vegetative parts of the plant which are often needed in order to complete an identification. The information about each species is adequate and includes each plant's family, scientific name, habitat, and flowering time. Measurements are given in English rather than metric which I assume was to appeal to the amateur botanical enthusiast rather than the professional botanist.

A glossary, guide to natural areas, and bibliography are valuable assets in this text.

Overall, this guide to wildflowers of the Appalachian region will serve as a good back-up reference for practicing botanists and will educate the less informed seeking to learn more about plants in this area of the country.

BARBARA L. RAFAILL. *Department of Biological Sciences, Georgetown College, Georgetown, KY 40324.*

Martin, R. E., E. P. Carter, G. J. Flick, Jr., and L. M. Davis (eds.). 2000. **Marine and Freshwater Products Handbook**. Technomic Publ. Co., Lancaster, PA. $174.95. 964 p.

Did you ever need to find information on marine or freshwater organisms, their biology, how to catch them, how to process and market them, and a host of other aspects but could not remember where that information was or where or how you could put your hands on it? Your searches are over for all you need to do is turn to the recently published 964-page *Marine and Freshwater Products Handbook*. Edited by four editors, 11 editorial associates, 56 authors have crammed myriads of information and facts imaginable into a volume which replaces the *Marine Products of Commerce* volume published in 1951.

After a long and torturous publication process, *Marine and Freshwater Products Handbook* is composed of eight sections: 1) general introduction; 2) aquatic life-chemistry and biology; 3) processing and presentation; 4) regulation; 5) other useful products from the sea; 6) seafood safety; 7) consumer acceptance, and 8) future outlook. Five pages list important website information. An index, p. 913-964, completes the volume.

Information relating to the biology and life histories of selected, usually commercially caught species of invertebrates and vertebrates are treated in Section 2. If you want to know how to pick or process a crab, squid, smoked or dried fish, process surimi, see Section 3. Laws and regulations, even pertaining to kosher foods, are found in Section 4. Seaweed products, fish meal, fish protein concentrates, cultured pearls, leather production, waste composting, and bioactive compounds from the sea can be found in Section 5. Contamination of shellfish growing areas, illnesses associated with seafood consumption (toxins, viruses, allergies, etc.) are treated in Section 6. Marketing and cooking (try stuffed crayfish heads, p. 186, not as bad as it sounds) and factors relating to fish flavor, odor, and quality changes are covered in Section 7. Comments, all too short, treat aquaculture, imports and exports, and the future of the industry in Section 8.

Each article has its own bibliography or suggestions for further reading lists that save you the trauma of flipping back and forth through hundreds of pages to find important information sources. Most literature references are up to date. While some articles are uneven in their treatment of a subject, to have gone into more detail would have produced an even larger and heavier volume than the present 2.54 kg (5#10.3 oz) volume. The editors and Sea Grant of Virginia are to be commended for the production of the handbook. It was a tedious and complicated task of meeting deadlines, retrieving text or galleys from the 56 authors while ever maintaining the goal of producing the handbook. Overall, you will get much for your money, not only in weight, but valuable information on a myriad of marine and freshwater products and species.

FRANK J. SCHWARTZ, *Institute of Marine Sciences, University of North Carolina, Morehead City, NC 28557-3209.*

Murdy, C. P. and *M. E. Brown Carter.* 2000. **Guide to the Plants of Granite Outcrops.** University of Georgia Press, Athens, GA. $19.95 hardcover. 106 p.

Granite outcrops are places of unique and often somewhat austere beauty. Much of the surface is bare rock, and the often thin, occasional soil seems almost an afterthought. The rigors of such an environment demand much of their inhabitants, and the vegetation consequently tends toward the sparse and low. However, what the flora lacks in biomass it makes up for in it unusual characteristics, and in a very high degree of endemism. The flora includes plants we might expect to see in deserts, such as Prickly Pear, Yucca, Agave, Sedums and other Stonecrops. It includes endemics such as the Flatrock Panic Grass and the tiny, lovely Menges' Rock Pink, which opens its blooms for a few hours in the afternoon and evening. A *Guide to the Plants of Granite Outcrops* is a great introduction to this unusual and captivating flora.

The book begins with a brief introduction to the geography and natural history of the southeastern granite outcrops. The bulk of the book is taken up with individual pages devoted to each of 80 species, with 108 species covered altogether. The photographs are beautiful and technically informative. Each photograph is accompanied by the scientific and common names, the family, a non-technical description, as well as occurrence and distribution information. I find guides like this to be very useful companions to unillustrated, more technical flora, as a means of "ground-truthing" my key work. I will make ample use of this one in both my own "botanizing" as well as in my teaching of field systematics. For the amateur botanist, the illustrated glossary at the back will also prove useful.

This book is clearly a labor of love. Its pleasing layout and beautiful photographs will serve well in spreading the love of granite outcrops to a larger group of amateur botanists and natural historians, and will be a welcome keepsake for those already familiar with their unique beauty and biology.

STEPHEN J. TONSOR, *Department of Biological Sciences and Pymatuning Laboratory of Ecology, University of Pittsburgh, Pittsburgh, PA 15260.*

Nourse, H. and *C. Nourse.* 2000. **Wildflowers of Georgia**. The University of Georgia Press, Athens, GA. $29.95. No pagination.

Anyone who is a collector of books that feature nature photography will certainly want to add this one to their collection. This is definitely one for the coffee tables of botanical types.

The preface introduces the authors' odyssey into their wildflower forays. It is well written, and I found myself wanting to meet the authors and go along with them on their searches. They make a great case for educating the public on natural plant communities, and their book provides a good starting point for the amateur wanting to learn a bit more about flowering plants and the ecosystems in which they reside.

The authors include photographs of wildflowers from four physiographic regions in Georgia. They mention that some species may be found in one or more physiographic regions, but provide no distribution maps which would make a nice

addition to the contents. However, they do provide a short summary of species that can be found within each physiographic region and provide suggestions as to where the hiker can find many of the flowers that characterize these locations.

While flowers are generally well photographed, the photos often exclude the vegetative parts of the plant and sometimes, the inflorescence. I have found this to be a drawback to plate type keys as it is usually necessary to see some of the overall morphology of the plant before an identification can be made. For example, the photos of fire pink and prickly pear cactus show nothing more than a close-up of one flower. Close-ups of the species labeled in landscape scenes would also be useful.

A drawback of this book is the lack of an index and continuous pagination. In writing this review, I had to keep flipping through the pages to go back to certain photographs that I had indicated in my notes. This would be particularly irritating to a beginning wildflower enthusiast who thought they had seen a certain species and needed to look it up.

All in all this book provides a good collection of beautiful photographs of many of Georgia's more common wildflowers in their native habitats and gives some useful information about where to travel to see them.

BARBARA L. RAFAILL. *Department of Biological Sciences, Georgetown College, Georgetown, KY 40324.*

Shetler, S. G. and S. S. Oril. 2000. **Annotated Checklist of the Vascular Plants of the Washington – Baltimore Area. Part I. Ferns, Fern Allies, Gymnosperms, and Dicotyledons**. National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Shetler and Oril's *Annotated Checklist...* is the most recent in a series of works for the Washington, D.C. area. The original checklist compiled by L. F. Ward (1881) encompassed an area defined by a 15-mile radius of the Capitol. Prior to Shetler and Oril's work the most recently published checklist was by F. J. Hermann in 1946, in which the coverage area was enlarged to include the (then current) collection limits of the D.C. Herbarium, that is 23 counties in Virginia and Maryland. Shetler and Oril have maintained the basic geographic boundaries of Hermann's work, while updating the taxa to be included and the taxonomic and nomenclatural changes that have occurred in the fifty years since Hermann's checklist. The authors include species known to occur in the D.C. area, based on an examination of specimens from the D.C. Herbarium and reference to all of the major regional floras. The *Annotated Checklist* is, then, a modern synthesis of species that occur in the Washington, D.C.–Baltimore area and not simply a revision of previous works.

The purpose of the current checklist is two-fold: One, Shetler and Oril see this work as a necessary first step toward the creation of an updated non-technical flora of the area. Two, the authors state that "...[the checklist] will include all native and naturalized species of vascular plants known to occur or to have occurred within the defined geographic area."

Four categories are used in the organization of the *Checklist*: Fern Allies, Ferns, Gymnosperms, and Dicotyledons. Families, genera, and species are listed alphabetically within each group. Native species are distinguished from non-native by typeface. Species entries include 1) accepted scientific name and author, 2) one or more common names, 3) synonyms, 4) distribution, and 5) status. Status of a given non-native species is designated "naturalized", "escape", or "waif", terms defined by the authors. Additional information may be given as comments, in some cases including reference to specific taxonomic treatments, specific location data, and more rarely, relative abundance.

Separate indices for scientific and common names are provided, as well as a map showing the geographical limits of the flora. Primary and principal literature sources are listed. A "Key to Abbreviations of Authors of Plant Names" is also given, a non-essential but convenient addition for the taxonomist.

Whether the reader will be pleased with the taxonomic treatment given various species is an open question. The authors state that they are generally "lumpers" when it comes to taxonomic treatment of questionable taxa. The authors admit that they have taken an over-all traditional view, apparently often leaning toward the more widely accepted, rather than the cutting-edge, view of taxonomic research. Treatments that may not conform to the views of certain authorities are often commented upon, with reference given to the authority in question.

Several strengths of Shetler and Oril's work are apparent. The *Checklist* provides an updated listing of the species that occur in the Washington, D.C. – Baltimore area, a work that has been much needed both because other lists are at least half a century old and because the geographical area has changed so much in recent years. The *Checklist* is easy to use for the both the professional taxonomist and amateur botanist. The alphabetical arrangement and the clear indices provide the user with an easy method of obtaining the necessary information. The basic and pertinent information for each species is available at a glance, and the differences in typeface make it readily apparent as to which taxa are native and non-native. The comments given for the taxa allow the reader to identify some of the species that may have a controversial taxonomic treatment and often additionally provide the reader with the name of an authority for an alternative treatment.

The only perceived weaknesses in the *Checklist* are relatively minor: more relative abundance data and, more importantly, more specific location data (as to counties rather than states alone) would be greatly appreciated.

Overall, Shetler and Oril's *Checklist* is notable. The amount of information present and the ease of use will make this work a commonly used reference for those interested in the vascular flora of the Washington, D.C. – Baltimore area. Based on the this checklist, I am eagerly looking forward to the companion list dealing with the Monocotyledons.

TODD CHRISTIAN YETTER, *Biology Department, Cumberland College, Williamsburg, KY 40769*

Stern, Kingsley R. 2000. **Introductory Plant Biology**. McGraw-Hill, Boston, MA. $49.00. 589 p.

In the arena of introductory textbooks, it is often difficult to find one that actually meets all of the needs of an introductory course. In choosing a textbook for such a course, one generally looks for: 1) a textbook that is visually interesting, 2) contains material that is presented at a suitable level while not glossing over details, nor over-simplifying, 3) that has examples from everyday life that students can relate to, 4) that has clear, supportive illustrations, and 5) has good summaries of chapter contents. This textbook has all of these features.

This textbook starts with an introductory chapter which focuses on the role that plants play in our lives and introduces the student to the many areas of plant biology. It follows with a chapter on the attributes of life and basic concepts in chemistry. The next six chapters cover plant anatomy from cells through to organs (roots, stems, leaves, flowers, fruits, and seeds). These chapters contain excellent illustrations which are a mixture of color line drawings, electronmicrographs, photomicrographs, and photographs. All of the illustrations are well integrated into the text of the chapter and are clear and well-labeled. Of particular importance is that the photomicrographs chosen are those that are typically examined in the laboratory portion of an introductory plant biology course. Thus, this textbook can serve as an excellent resource for both lecture and laboratory.

From anatomy, the textbook moves to physiology. The author does a nice job of integrating form (anatomy) with function (physiology) in three chapters. Topics covered include: water movement, photosynthesis and cellular respiration, hormones, plant movements, and photoperiodism and phytochrome. One useful feature regarding the treatment of photosynthesis and cellular respiration is that three different approaches are included: one which gives the essence of the processes, one that is an introduction to the major steps, and the third which is a closer look at the process. It is often difficult, as an instructor, to choose a level at which to present these processes to students since these processes are among the most difficult for students to understand. Presentation of three different approaches provides helpful flexibility to the instructor. Also since all three approaches are in the textbook, it allows students to see additional aspects of these processes (and maybe they will accidentally learn something extra).

The next three chapters deal with reproduction and genetics. First there is a chapter on meiosis with an introduction to alternation of generations. Next is a chapter of genetics. This chapter is very broad in scope covering the basics of Mendelian genetics and molecular genetics from the structure of DNA to translation. The third chapter is about biotechnology and plant propagation. While there is a lot of interesting material such as forms of plant propagation that students would have experience with (like cuttings), it is probably a chapter that most instructors would not have sufficient time to include.

After a chapter on evolution, the textbook moves to eight chapters covering the diversity of plant life. As with the chapters on anatomy, the choice of illustrations is excellent. Again, many of the organisms chosen are those that would be examined in the laboratory, increasing the utility of the textbook. It is a little disappointing that many of the line drawings, especially for the life cycles, do not show the attention to detail that is evident elsewhere in the book. One nice feature of the life cycles,

though, is that the sporophyte structures are consistently shaded in one color while the gametophyte structures are shaded in another color. This is visual reminder to the students how gametophytic and sporophytic structures are integrated in the plant body.

This textbook finishes with chapters on the uses of plants in different cultures, ecology, and biomes. Topics covered in these chapters are reminders that plants have played, and continue to play, very important roles in our everyday lives. Also, plants are only one part of a healthy ecosystem in which plants are integrated with other organisms as well as the non-living environment.

Following the main body of the textbook is a series of five appendices. Among these are appendices describing the use of biological controls, useful plants and poisonous plants, and houseplants and home gardening. Many students initially equate plant biology/botany with gardening and plant identification, so these appendices should be of interest to students. Most textbooks in plant science do not contain these horticultural or practical aspects of plants.

Introductory Plant Biology by Stern is a well-illustrated, well-rounded textbook. One feature of this textbook that is weak, however, is the review questions. Not enough of these questions focus on key aspects of the chapters and many of the questions are vague. This one weak feature, though, is far outweighed by the many features that are carried through very well. The author has taken care to engage the students as much as possible by concentrating on common plants, including examples that students can relate to, and including appendices that encourage students to appreciate plants. The past success of this textbook and the approach that it takes is attested by the fact that this textbook is now in its eighth edition and it will surely be around for a ninth edition.

CAROL L. WYMER. *Department of Biol. Env. Sci., Morehead State University, Morehead, KY 40351-1689.*

Strickberger, Monroe W. 2000. **Evolution**. Third Edition. Jones and Bartlett Publishers, Boston. $71.95 hardcover. 722 p.

As in previous editions, Strickberger's new third edition of *Evolution* is organized into four frameworks: (I) the Historical (including preDarwinian ideas, objections to and evidence for Darwin's theory, and the disagreements between evolution and religion), (II) The Physical & Chemical (dealing with the origin of the universe and of life), (III) The Organic (including genetic constancy and variability, systematics: phylogeny/phenetics/cladistics/evolutionary classification, molecular phylogenies, differentiation and evolution of development, and seven chapters on evolution of the various taxonomic groups), and (IV) The Mechanisms of evolution (dealing with equilibrium and changes of gene frequencies, the neoDarwinian synthesis, neutralist and selectionist arguments, modes of speciation, and culture and control of human evolution). The chapter dealing with genetic variability in framework III would seem to fit better in framework IV on mechanisms for evolution.

The book is suitable as a college textbook for biology majors who have had prior introductory biology courses. End-of-the-chapter summaries, key term lists,

discussion questions, and bibliographies will be helpful to the student. The bibliographies are extensive and up to date, including references from 1999. There is a website leading to student exercises and additional references accompanied by descriptions of content and including rare books and special collections. The text includes boxed reviews of special topics and profiles of scientists actively engaged in research in evolution. There are footnotes giving useful information which is not essential for understanding of the text. Illustrations are excellent, and explanations are clear with good transitions to new topics. There is a glossary and both author and subject indexes.

Evolution is refreshing in its candid look at some of the problems, particularly with the origin of life, such as the interdependence of nucleic acids and proteins (requirement for a large number of enzymes for replication of the DNA code and translation, even in the smallest cellular organisms, and, at the same time, the requirement for a self-replicating code for specifying a functional protein structure). Problems with an autocatalytic RNA world are also thoroughly examined. Minimum size for an RNA capable of catalytic activity would be a triple stem loop containing 40-60 nucleotides. "Such an RNA replicase could hardly have arisen by chance, nor can we visualize how intermediary steps in its evolution would have been functional" p. 142. If an RNA world existed, "'why would a device for making polypeptides evolve in an organism that had no use for protein?'" Various suggested solutions to the problems are discussed. "Answers" (to the problems with an RNA world), "if possible, depend on further molecular investigations and reconstructions" p. 143.

A problem not discussed in the book would be in the laboratory simulation of origin of life in which the pure dry l-amino acids in appropriate combination needed to make proteinoids are not found in the racemic mixture produced from the suggested primitive earth atmosphere of NH_3, H_2, CH_4, H_2O (or other combinations that include CO). Water, d-amino acids, sugars and other impurities would need to be removed somehow before proteinoids could be produced. There is, however, a thorough treatment of the chemical reactions needed to produce the basic biological molecules necessary for life.

Many books in their discussion of evolution state or imply that rediscovery of genetics directly solved many of the problems in Darwin's theory (such as how selection could recognize and favor the very small modifications he proposed). Strickberger, while mentioning this, does give an accurate picture of the conflict that arose between views of discontinuous variation, as espoused by early 20th century geneticists, and continuous variation (pages 515-518). These differences persisted for several decades until the "synthetic" view was proposed and accepted.

The view that there were no vertebrates until the Ordovician Period continues to appear in evolution books despite the finding of vertebrate evidence in the Cambrian. This origin in Ordovician view appears in Strickberger in a table on page 93, but in a phylogenetic scheme on page 368 he shows the correct time of origin. Also a late Cambrian date is mentioned on page 398.

Strickberger is appropriately tentative about color camouflage adequately explaining shifts in populations of dark and light moths (industrial melanism), page 541. He is apparently aware of recent evidence that shows the moths don't normally rest on tree trunks. Also there have been changes in proportion of the populations in locations where change in darkness of the background has not occurred. For example, there has been a shift toward higher frequency of light moths in

southeastern Michigan, where there has been no change in lichen abundance (paralleling the shift in England that accompanied the reduction of soot in the environment, Majerus, 1998).

Strickberger states in his responses to creationist arguments (Box 4-1, page 67) that creationists insist new species cannot appear after the initial creation period. To be fair it should be pointed out that the more biologically informed creationists would not say this (Davis et al., 1993). The anatomical discontinuities do not occur between different species of the same genus, but rather between families or orders (elephants in one order, bats in another, etc.) and higher.

Statements given about the late date for writing of the Five Books of Moses in the Old Testament ("400 years later than many of their described events", p. 62 footnote) and the 175-year gap between the death of Christ and the earliest surviving copies of manuscripts are not accepted by all the authorities (Archer, 1974).

The text generally gives the various viewpoints on issues where there is disagreement. Because of its broad, competent coverage of all the evolutionary topics (including anthropology, biochemistry, molecular biology, comparative anatomy, paleontology, population ecology, population genetics, and systematics) and its extensive references, Strickberger's third edition of *Evolution* deserves a place in university libraries and as a text for undergraduate courses in evolution.

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2000 Meeting banquet.

NEWS OF BIOLOGY IN THE SOUTHEAST

Jon R. Fortman-News Editor
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ABOUT PEOPLE AND PLACES

ALABAMA

The University of Alabama at Birmingham, Department of Biology. Ken Marion, former ASB President, was named Chair of the Department of Biology effective June 15, 2000. He replaced Dan Jones, who was chair for 20 years. Dr. Jones has been named Professor Emeritus. Robert Thacker, a marine phycologist/limnologist from the **University of Guam**, will join the Department as an Assistant Professor in September 2000.

GEORGIA

Fernbank Science Center, Department of Botanical Sciences. The DeKalb School System's Fernbank Science Center greenhouse features monthly plant or bulb giveaways to visitors during Sunday open houses. While the supply lasts, each visitor may take home the following plants: September: *Setcresea purpurea* - "Purple Heart" (plant); October: *Viola* spp. - "Pansy"' November: *Narcissus tazetta* - "Paperwhite Narcissus" (bulbs), and December: *Mimosa pudica* - "Sensitive Plant." Except for DeKalb County School System administrative holidays these Victorian greenhouses are open to the public on Sundays from 1 to 5 P.M. There is no admission fee and a horticulturist is available to answer questions on indoor and outdoor gardening.

KENTUCKY

Morehead State University, Department of Biological and Environmental Sciences. Dr. Cynthia Trombino has joined the staff to fill the position in Ornithology and to coordinate biology teacher education and environmental education. Dr. Trombino received her Ph.D. in ecology and evolution from **Northern Illinois University**. Dr. Ted Pass, Professor, was named the 36th Distinguished Teacher of the University for 1999/2000, being the 7th departmental member to receive the honor. Dr. Joe E. Winstead has vacated the position of Chair of the department after a four-year tenure to assume a new role as Dean, School of Science and Technology at **Southern Arkansas University** in Magnolia. Dr. David Magrane has filled the Chair's position.

MISSISSIPPI

University of Mississippi, Department of Biology. Dr. Tammy Goulet (Ph.D. SUNY Buffalo) will join the department in January 2001 as Assistant Professor. Dr. Goulet is currently a Research Fellow at Harbor Branch Oceanographic Institution. Dr. Goulet studies the evolution of symbioses. Dr. Gary Gaston, Professor, and Dr. Larry Shaffer, Adjunct Assistant Professor, conducted two courses in Belize during the summer session 2000. The Department's Belize teaching program is in its second year.

Mississippi University for Women, Division of Science and Math. Dr. Barry Posin has agreed to stay on as Interim Head of the Division for the 2000-2001 academic year, as the search continues for a permanent division head.

SOUTH CAROLINA

Butterfly Kingdom, Hilton Head Island. Butterfly Kingdom, a project of Ecological Investments, LLC, is building a 48,000 square foot facility on I-95 near Hilton Head Island, in southern South Carolina. The building which should be open in mid 2001 includes a 13,000 sq. ft. conservatory (with tropical, grassland and desert ecosystems and 4,000 butterflies in flight), the largest in North America, an Insect Zoo, a Nocturnal Insect exhibit, and an Insect Learning Center. A 13,000 sq. ft. 3-D IMAX theater will be attached and there will be over 18 acres of gardens. The scientific staff includes Jaret Daniels, Ph.D., Curator of Butterflies who came from the **University of Florida**. The director of the Conservatory is Ed Spevak, Ph.D., moved from the Bronx Zoo in New York where he was Curator of Mammals and Invertebrates. Robert Wolff, Ph.D., Director of Education, left **Furman University** to join Butterfly Kingdom. An active research program is planned, and will include opportunities for faculty on sabbaticals, graduate and undergraduate students, and postdocs. The research will focus on conservation of invertebrates and their display, but facilities are being planned which include systematics and molecular labs. Input as to projects, lab design and equipment are welcomed. Formal agreements have been completed with the Entomology Departments at four universities so far: **Clemson University, University of Florida, University of Georgia, and Michigan State University**. For further information, contact Bob Wolff at (843) 671-3200, FAX (843) 342-2976 or rwolff@butterflykingdom.com.

MUSEUMS AND BOTANICAL GARDENS

ALABAMA

Anniston Museum of Natural History. The summer of 2000 marks the 70th anniversary of the Museum. Brought to the City of Anniston in 1930, the Museum has grown to become one of the Southeast's finest natural history museums. August 12 was celebration day with performances, children's activities, live animals, and free admission. A special exhibition "Earth from Space" was displayed June13-August 20,

2000. This fascinating collection included full-color satellite images and revealed the complexity and beauty of the planet Earth as seen from space.

Michael C. Carlos Museum, Emory University. "Mysteries of the Mummies" will be displayed through summer 2001. The Museum is now in the process of cleaning and conserving objects contained in its important recent acquisition of remarkable ancient Egyptian artifacts. This work, along with detailed scientific analysis, will take place over the next two years. An intriguing "peek" at some of the objects included in the collection will take place via a rotating exhibit of at least one major conserved artifact approximately every six months. Beginning July 19, the first objects on display will include the beautifully painted coffin of lawtaysheret, from and important Theban family that served the Nubian rulers of Egypt in the 25th Dynasty (ca. 700 BC). Also, from the same time period, the first installation will feature the coffin and mummy of a child and a set of limestone Canopic jars (which held the organs removed in the process of mummification). The rotating exhibitions will culminate in a special exhibition of the entire collection in spring 2001, titled "Mysteries of the Mummies: The Art and Archaeology of Death in Ancient Egypt."

2000 Meeting banquet.

TRI BETA DISTRICT I PAPERS

MORALES, CERINDA M. Eta Lambda, Loyola University, New Orleans -Foraging efficiency of largemouth bass (*Micropterus salmoides*) in introduced and native submerged aquatic vegetation.

Many North American waters have been invaded by introduced species of submerged aquatic vegetation. Once an exotic species is introduced, it tends to replace native species, and changes in fish community structure are often observed, although the actual mechanisms of change remain unclear. One possible mechanism is growth form of invading plant could adversely affect foraging efficiency of predators, and thereby alter food web structure. For example, introduced Eurasian water milfoil (*Myriophyllum spicatum*) is structurally complex with leaves that emerge from stem in whorls. In contrast, native tapegrass (*Vallisneria americana*) has simple, flat blades. I hypothesized that foraging efficiency of juvenile largemouth bass (*Micropterus salmoides*) would be lower in *M. spicatum* than in *V. americana*. During first five minutes, plant type (*M. spicatum* or *V. americana*) had no effect on forage rates of largemouth bass. Forage rates were much lower in habitats with low stem density, possibly because there was not enough cover for bass to forage freely. After six hours, forage rates in habitats with high stem density were similar for both plant types, whereas forage rates in habitats with low stem density were significantly lower in *V. americana* than in *M. spicatum*. It appears that structurally complex whorls of introduced *M. spicatum* allow for increased foraging efficiencies lower stem densities that native *V. americana*.

COFER, CAROLINE, DEBORAH MYERS, AND THOMAS TONEY. Kappa Gamma, Georgia College and State University -Effects of long and short term ovariectomies on uterine proteins in adult female rats using SDS-PAGE.

Work in Progress. Steroid hormones play a crucial role in the regulation of protein synthesis in a number of different tissues. Experiments have been designed in order to obtain evidence of a physiological role for ovarian estrogens in the regulation of protein synthesis in the uterus of female rats. Adult female rats were monitored by daily lavage and only rats exhibiting two or more consecutive 4-5 day estrous cycles were used. Rats were subsequently ovariectomized for either a short-term (7 days) or long-term (28 days). In addition, half the rats in each group received estrogen replacement while the others received corn oil vehicle. After the appropriate time period, rats were killed and uteri were removed and frozen in buffer. SDS-PAGE is being performed on uterine homogenates to determine the patterns of protein "bands" for each treatment. We anticipate that results will show differences in both the number of protein bands as well as differences in the intensity.

BREITBART, MYA. Sigma Psi, Florida Institute of Technology -Cyclin B1 expression in exponential and synchronous populations of the L1210 mouse leukemic cell line.

Cyclins, in tandem with cyclin-dependent kinases, are critical in regulating cell cycle progression. Cyclins such as B1, D, E, and A are discontinuously expressed during the cell cycle in normal cell lines. Unscheduled cyclin expression has been demonstrated in multiple transformed cell lines. Optimally, the relationship between cyclin expression and cell cycle progression should be determined in synchronous cell populations. However, standard selection and induction synchronization methodologies for mammalian cells often induce cell cycle disturbance and result in cell populations of limited purity. My research demonstrates the use of the baby machine technique as an effective synchronization methodology for the mouse leukemic cell line L1210 as illustrated by the size distributions and DNA compositions of the newborn cells during cell cycle progression. In addition, bivariate flow cytometry is used to examine cyclin B1 expression in both exponential and synchronous L1210 cell populations over the course of two cell cycles. This analysis confirms that cyclin B1 expression begins during mid-S phase and continues through G2/M in the L1210 cell line.

WANAT, KAROLYN A. Sigma Psi, Florida Institute of Technology -Measurement of levels of DNA binding proteins in *Escherichia coli* at different growth rates and during the cell cycle.

To properly time initiation of chromosome replication during the *Escherichia coli* cell cycle, a nucleoprotein complex is assembled and disassembled on the unique chromosomal replication origin, *oriC*. Two proteins, FIS and IHF, are involved in changing complex formation. Through most of the cell cycle, FIS is bound. At initiation, IHF becomes bound, while FIS is absent. Shortly after initiation, the complex resets to the original formation. Although these different complexes have been described, it is not clear what drives the assembly and disassembly of the initiation complex. One possibility is levels of FIS and IHF in the cell could change, causing a switch in proteins contained in the complex. To determine if protein levels drive initiation complex formation, Western blotting analyses measured levels of IHF and FIS from synchronized bacterial cultures and cultures at different growth rates. These results indicate that IHF levels are constant throughout the cell cycle and at all growth rates. Results published by others suggest that FIS levels decrease as growth rate slows. This may indicate that the ratio of IHF and FIS changes as a function of growth rate, which may affect the nucleoprotein complexes under conditions when nutrients are limiting.

MCCOY, ERIC AND TERRY ARRINGTON. Beta Omega, Mercer University - Characterization of insect cDNA clones associated with major metabolic pathways.

A tobacco hornworm (*Manduca sexta*) fat body polyclonal antibody was used to isolate conserved prophenoloxidase cDNA clones from libraries representing three different insect species (*Derobrachus geminatus*, *Schistocerca americana*, and *Acheta domesticus*). Phenoloxidase is associated with insect cuticle formation and the primary immune response (*e.g.*, encapsulation). Open-reading frames of partial DNA sequences demonstrated significant identities to two vertebrate enzymes that participate in glycolysis (6-phosphofructo-2-kinase/fructose-2, 6-bisphosphatase) and purine biosynthesis (multifunctional enzyme ADE2). These enzymes are paramount in the biochemistry of insect flight and uric acid excretion. A third clone, a putative tyrosinase, might encode prophenoloxidase: further characterization is warranted. This undergraduate-directed research program has been funded by R&D grants from the College of Liberal Arts and the Mercer University School of Medicine.

VANDERVELDE, GRAYLING, Psi, Winthrop University -Relic plant species along the Catawba River in Lancaster County, South Carolina.

A survey of the vascular flora was conducted of a privately owned tract of land along the Catawba River in Lancaster, SC. The surveyed area was broadly comprised of six disturbed plant communities: 1) north facing granitic exposure, 2) river floodplain, 3) streambeds, 4) power line right-of-way, 5) mesic hardwood forests and 6) early successional old field. Some areas of the exposed granite and along the streambeds have been preserved because of their topography and recent conversion to a private game reserve. These “islands” retain some of their historic character, including many species whose range is more typical of the more westerly Appalachian Mountains. Many county records and one state record were discovered on this tract. Its future is uncertain because of plans to build a sewer line directly through the areas where most of the relic species were found.

CHERA, BHIOHAM. Psi, Winthrop University -Determining maternal inheritance by mtDNA genetic comparison of the de Brazzas monkeys (*Cercopithecus neglectus*).

With the increasing threat of human encroachment through political, economic, and ecological disruptions, the de Brazzas monkeys of East Africa are in need of governmental protection. In order to ensure the successful survival of the monkeys in reserves, the dynamics of their social structure must be understood. Due to the poor visibility in the rain forests and the cryptic behavior of the de Brazzas, observational field studies have failed to fully elucidate the social structure of the monkeys. Dr. Janice Chism, professor at Winthrop University, has postulated that the females disperse from one family to another in the wild. Comparison of mtDNA between individuals in a population was used to test female dispersal and maternal inheritance. Various chemical and analytical centrifugation techniques were

employed to extract mtDNA from fecal samples of a family of de Brazzas monkeys from the Riverbanks Zoo, Columbia, SC. Polymerase chain reactions were used to amplify the D-loop region for use as a marker. Basic Gel Electrophoresis was used to observe the marker. mtDNA was successfully extracted, amplified, and observed on 1% agarose gels for three fecal samples. The next step in this study will be to isolate and sequence the markers for genetic comparison.

SELLERS, KATHLEEN W. AND DR. DWIGHT DIMACULANGAN. Psi, Winthrop University -Molecular mechanism of California blackworm regeneration.

The California blackworm (*Lumbriculus variegatus*), is known for its ability to regenerate when cut from either the posterior or anterior end. The molecular mechanism for this regeneration, however, has not been extensively researched. This study addressed molecular and morphological changes during anterior and posterior regeneration. The first goal of the study was to identify genes differentially expressed in invertebrate regeneration. The second goal was to classify morphological changes during California blackworm regeneration. During this study, California blackworms were cut and allowed to regenerate before the anterior and posterior regenerating ends were removed and analyzed. RNA was isolated and quantified using the Qiagen RNeasy kit. mRNA differential display was used to identify differentially-expressed genes between regenerating and non-regenerating tissue. Northern blot analysis will be used to verify that the identified genes are differentially expressed. DNA from these genes will be sequenced and compared to known gene sequences. Ultimately, this research will contribute to the molecular mechanism of invertebrate regeneration.

WARD, ANDREA B. Beta Rho, Wake Forest University -Functional morphology of raptor hindlimbs: A comparative study of hawks and owls.

Prey capture in owls and hawks is largely dependent on the biomechanics of hindlimbs, and both limb size and talon forces potentially determine the prey size range and the extent of possible resource partitioning amount sympatric species. Anatomical study and muscle measurements of six species of sympatric raptors: the owls – *Otus asio*, *Strix varia*, and *Bubo virginianus* – and the hawks commonly considered their diurnal "ecological equivalents" – *Falco sparverius*, *Buteo lineatus*, and *Buteo jamaicensis* – revealed that, in both groups, talon closure is effected by a recently described dual and additive system of muscle action. Grip force measurements obtained from live owls and hawks using a type of "hydraulic" perch showed that grip force increases exponentially with body size and that owls appear to produce greater forces than hawks. This finding is consistent with their distinctive foot anatomy, muscle structure, and hunting behavior. These data provide some understanding of the different demands of diurnal and nocturnal hunting as well as the mechanism of coexistence for these six species in eastern woodlands. Funding was provided by Beta Beta Beta.

KINGSTON, MARGARET. Beta Rho, Wake Forest University -A microscopic study of the degeneration and reformation of adductor muscles during development of juvenile freshwater mussels.

Freshwater mussels have a unique larval stage, the glochidium, which develops a pair of shells and a single adductor muscle that helps the larva attach to a host fish for further development. During metamorphosis this single muscle degenerates and two new muscles form. These will become the anterior and posterior adductors of juveniles and adults. Little information is available about the details of how transformation to the adult musculature occurs. In our laboratory we have been able to culture larvae of the mussel *Utterbackia imbecillis* without requiring a host fish. Metamorphosis requires about 8 days. In the present study I was interested in following the degeneration of the larval adductor and the *de novo* formation of the new muscles during development. To visualize the adductor muscles, specimens were relaxed, fixed in formalin, solubilized in Triton-X 100, stained with a fluorescent probe that binds specifically to F-actin (Alexa 488), and then viewed with fluorescence microscopy. Prior to metamorphosis the larval adductor was prominent and centrally located. By day 4 of metamorphosis the original adductor was visible, but its structure was disorganized. By days 5 and 6 newly forming juvenile muscles were detectable. At the end of metamorphosis, the two adductor muscles appeared to be fully formed.

BUSCHER, APRIL LAVERNE. Beta Rho, Wake Forest University -The effects of odorants on facial skin blood flow in the rat.

The trigeminal nerve responds to chemicals in the nasal cavity. It also innervates arteries and glands throughout the head and face. Electrical stimulation of the trigeminal nerve increases facial blood flow. The present study tested whether the presentation of a volatile chemical delivered to the nasal cavity of rats increases facial blood flow. A laser-Doppler flowmeter probe was used to measure blood flow in the facial skin of rats. Half of the rats were pretreated with guanethidine to test for possible sympathetic involvement. Several concentrations of cyclohexanone were presented via an olfactometer while facial skin blood flow, blood pressure, and heart rate were measured. The highest concentration of cyclohexanone presented resulted in the highest increase in blood flow. Blood flow changes were lower in rates given guanethidine than those that were not given guanethidine. A possible explanation for the increased facial blood flow in response to cyclohexanone is that stimulation of trigeminal nerve fibers may have caused them to release neuropeptides, which cause dilation of facial blood vessels and hence increased blood flow. However, the higher blood flow increases for the rats that had not been treated with guanethidine suggests that sympathetic stimulation may have also played a role.

ACHAT, CINDY N. Tau Chi, Armstrong Atlantic State University -Cocaine-induced sensitization - The effects of repetitive cocaine exposure on $GABA_A$ receptors of the striatum and on behavior in rats.

When repeated exposure to the same drug evokes progressively exaggerated responses, sensitization to that drug has occurred. Sensitization is associated with central nervous system stimulants such as amphetamines, cocaine, and opiates. Prolonged dopamine transmission has been linked to the occurrence of sensitization. This study investigated the effects of cocaine-induced sensitization on the behavior of rats and on the quantity and quality of benzodiazepine binding sites of $GABA_A$ receptors in their striatum and cortex. Eleven rats were given 20 mg/kg of cocaine and 11 given saline. Treatments were administered on days 1, 7 and 14. The Ernst scale revealed that the behavior of the cocaine-treated rats increased in intensity and the response time to the cocaine decreased with repetitive exposure. Subjects were sacrificed on day 15 and Quantitative Autoradiography showed that there was no decrease in the number of benzodiazepine binding sites on $GABA_A$ receptors in the striatum, cortex and nucleus accumbens. However, uptake of radioactive chlorine was lower for cocaine-sensitized rats. These results suggested that there was no effect of cocaine-induced sensitization on the number of benzodiazepine binding sites on the $GABA_A$ receptors, and that cocaine-induced sensitization decreases $GABA_A$ -stimulated chlorine uptake in the striatum.

TRI BETA DISTRICT II PAPERS

CLARK, LORI ANN AND MARK CHRISTENSEN. Beta Upsilon, Georgetown College -Fibrillarin: Divergence marker of eukaryotic cells from archaeal domain.

Fibrillarin plays a crucial role in rRNA cleavage, methylation and ribosome assembly. It has been shown by sequence analysis to be found in the domain *Eukarya* and the domain *Archaea*, yet absent in domain Bacteria. In addition, eukaryotic fibrillarin contains an approximately 80 amino acid N-terminal region (GAR domain) which is absent in archaeal fibrillarins. These observations suggest that fibrillarin could be a plausible indicator of evolutionary relationships, as compared to the 16s rRNA phylogenetic trees complied by Woese (Pennisi, 1998, *Science* 280, 672). Nine archaeal and eleven eukaryotic complete fibrillarin sequences were obtained from *Genbank*. *Clustalw*, a general use multiple sequence computer alignment program, was used to align known fibrillarin gene sequences in an effort to examine its conservation among the two domains. *TreeView*, a phylogenetic tree-viewing program, was also used to graphically illustrate sequence data as well as to ascertain the resulting classifications. A series of four sequencing comparisons were made- first, the nine archaeal sequences; second, the eleven eukaryotic sequences; third, the 20 sequences combined; fourth, the 20 combined with the eukaryotic GAR domains excluded. Phylogenetic analysis of the available fibrillarin sequences has been shown to confirm the universal rRNA-derived tree with the exception of *S. cerevisiae*.

DAVIS, HEATHER. Mu Chi, Midway College -Effect of long term social experience on lateral giant fiber mediated escape responses in the crayfish, *Orconectes rusticus.*

Tailflips in crayfish are distinctly different whether they are caused by the lateral giant (LG) neuron or by the medial giant (MG) neuron. It was shown that in dominant crayfish, the LG neuron is more likely to produce an electronically induced tailflip when in a serotonin bath (Yeh, 1996). In addition, it has been demonstrated that the direction and latency of LG and MG tailflips are so distinct that one can distinguish the two visually (Wine, 1970). Because of these two studies, it was hypothesized that in socially dominant crayfish, the LG tailflip would be more often observed than the MG tailflip. Crayfish were obtained from the Midway College stream, and tested with a series of taps and their type of response was observed. Data was tabulated, and it was found that there were slightly higher LG mediated responses in dominant crayfish, slightly higher MG mediated responses and greatly higher MG mediated responses in isolated individuals.

DESALVO, JOANNA, STEPHANIE SANBORN, AND DR. FRANK JORDAN. Eta Lambda, Loyola University -Distribution and habitat use of damselfly larvae in the estuarine portion of the St. Johns River, Florida.

Estuaries are characterized by gradients in salinity, habitat structure, and other environmental conditions. We examined how these environmental gradients affected distribution of larval damselflies (Insecta: Odonata) in the estuarine portion of the St. Johns River, Florida. Two species of *Enallagma* were found in this system, and their relative abundance varied between oligohaline and tidal freshwater sites. Acute tolerance experiments indicated that survival of damselfly larvae was not directly affected by salinity. Therefore, large-scale variation in salinity appears to affect damselfly larvae indirectly by limiting the availability of preferred habitats and by mediating the outcome of interactions between different species. Damselfly larvae were considerably more abundant in beds of submerged aquatic vegetation (SAV) than in adjacent sand flats. Behavioral experiments indicated that damselfly larvae preferred SAV over bare sand, that this preference did not change between day and night, and that predation rates on damselfly larvae were considerably lower in tanks containing SAV than in tanks containing bare sand. Therefore, variation in habitat use by damselfly larvae appears to be affected by factors (e.g., relative risk of predation) operating on small spatial scales.

ROSSI, GIANNA. Eta Lambda, Loyola University, New Orleans -Effects of estrogen on working memory performance assessed in the water maze in middle-aged female rats.

Previous results indicated that estradiol enhances working memory performance of young female rats in the water maze. This study examined the effects of estradiol in middle-aged female rats. Twenty female rats aged one year were ovariectomized and implanted with Silastic capsules containing either cholesterol, 50% or 100%

estradiol. After thirty days, 16 days of testing began, each day consisting of one information trial followed by a fifteen second or one hour delay and three retention trials. Each day the platform was moved to a different quadrant and the rat was allowed 60 seconds to find it, after which was led there and allowed to remain for 20 seconds. Estrogen treatment did not reduce the latency, the time it takes to reach the platform, or path length to escape on retention trials, but did cause a reduction on information trials. Therefore, the effects of estrogen differ between young and old female rats and the performance difference on trial one suggest the possibility of different search strategies. Alzheimer's disease is characterized by working memory deficit. This experiment indicates that estrogen may enhance performance on a working memory task in middle-aged female rats, supporting that estrogen replacement therapy in post-menopausal women may be beneficial.

COUVILLON, MARGARET. Eta Lambda, Loyola University -Histone phosphorylation during the cell cycle of yeast *Schizosaccharomyces pombe.*

Representatives from invertebrates, vertebrates, plants, yeast, and protozoan all display histone phosphorylation within the C-terminal region of their H2A histones. This modification may disrupt the chromatin structure and has been thought to be a precursor to such activities as transcription, replication and chromatin assembly. The conservation of this process through such a varied subset of the biotic world demonstrates its importance; a fundamental understanding of histone phosphorylation is necessary to better grasp chromatin structure and function. This research explores the levels of phosphorylation during the cell cycle in the fission yeast *Schizosaccharomyces pombe*. Four temperature-sensitive mutant strains (FY4, FY583, FY569, and FY584) were obtained and grown on liquid YES media. When placed in a 36 C water bath, the cells arrest at different stages in the cell cycle. The levels of phosphorylation for the temperature-sensitive mutants, their controls, and the wild type (FY7) were then compared using high-resolution two-dimensional polyacrylamide gel electrophoresis.

CANNON, JENNIFER. Mu Epsilon, Troy State University -Cytological changes in the structure of *Fundulus* gills after exposure to clotrimazole, an inhibitor of eicosanoid metabolism.

The objective of the study was to determine whether exposure to clotrimazole indirectly caused cytological changes in the gills of the killifish *Fundulus heteroclitus.* Clotrimazole is an inhibitor of eicosanoid metabolism via the cytochrome P450 pathway. Eicosanoids play a role in reducing membrane permeability to water and facilitating ionoregulation. Fresh-water adapted killifish were exposed to clotrimazole (1 M) for 24 hrs prior to transfer to full-strength sea water (35 ppt) containing the same concentration of clotrimazole. After two additional days of clotrimazole exposure in sea water, the fish were sacrificed , along with control fish similarly treated with an ethanol vehicle. After the two-day exposure to sea water, the fish were sacrificed. The gills were fixed with 4% phosphate buffered paraformaldehyde and then postfixed in 1% buffered osmium tetroxide. The gills were embedded in

Spurr's epoxy. Semithin sections were stained with methylene blue. Preliminary measurements indicate that in the gill filaments of treated specimens, chloride cells were about 1/3 larger and about twice as numerous as those in the control, probably reflecting greater activities of the treated. However, the widths of the respiratory lamellae showed no statistically significant differences between the control and treated.

SKELTON, EMILY. Pi Delta, East Tennessee State University -Bat conservation through engineering and education at Fall Creek Falls Tennessee State Park.

In the mammalian order Chiroptera there are thirty-nine species in the United States. Nineteen of these are in Eastern United States and sixteen in Tennessee specifically. Eight species are thought to inhabit the Fall Creek Falls TN State Park area; however, only five were found during the summer of 1999 to do so. Fall Creek Falls TN State Park is located in Van Buren and Bledsoe Counties in the Cumberland Plateau physiographic region of Tennessee. Bat habitats were surveyed visually during May and July of 1999. During the six and a half week study, bat activity and bat/visitor interaction were observed and examined. Various bat populations were found occupying different sites in the park. Eight bat houses were placed strategically throughout the park, following the specifications of bat house placement. The Eastern Red Bat (*Lasiurus borealis*), Eastern Pipistrelle (*Pipistrellus subflavus*), Indiana Bat (*Myotis sodalis*), Big Brown Bat (*Eptesicus fuscus*) and Little Brown Bat (*Myotis lucifugus*) were all found within the Fall Creek Falls TN State Park boundary.

CARY, L. CURTIS. Mu Gamma, Western Kentucky University -Impact of elevated environmental temperature on cytokine synthesis and nitric oxide production during experimental Chagas' disease.

C3H mice that have been infected with a Brazil strain of *Trypanosoma cruzi* and maintained at an elevated environmental temperature of 36 C survive an otherwise lethal infection. These mice show increased longevity and a dramatic decrease in parasitemia levels. In contrast, C3H mice maintained at room temperature (RT) typically experience high parasitemia levels and die within 40 days of infection. The goal of the present study was to analyze cytokine synthesis and nitric oxide (NO) production in spleen cells from mice infected with 10^4 blood form trypomastigotes of *T. cruzi* and maintained at either RT or 36 C for 36 days. On day 36 of infection, mice were anesthetized. Blood was obtained by a cardiac puncture and spleens were removed aseptically. A single cell suspension was prepared and cells were diluted to a final concentration of 6 x 10^6 SC/ml. Spleen cells were incubated with or without concanavalin A (ConA) for 60 hours. Culture supernatants were analyzed for NO production using the Griess reaction and IFN- and IL-10 synthesis was measured by an antigen capture ELISA. Results showed culture supernatants obtained from RT mice showed higher levels of NO and IFN- than mice maintained at 36 C. Levels of IL-10 were similar in both groups.

NUNNALLY, AMY P., DAVID SPENCER, JR., AND KATHARINE M. MAYNE. Kappa Psi, Birmingham-Southern College -*In vivo* expressed genes in *Streptococcus pneumoniae.*

Streptococcus pneumoniae is an important causative agent for pneumonia, septicemia, and bacterial meningitis. We hope to isolate bacterial genes involved in disease by finding those that are expressed during animal infection but not in laboratory culture. Genes exhibiting an *in vivo* expression pattern are good candidates for new pathogenesis genes. We report the creation of a reporter system for identifying promoters expressed in this manner. We have created a promoter-cloning plasmid, pKMMtnpR, to be used to find promoters active specifically in the murine host. A DNA fragment containing the *tnpR* gene without its promoter was inserted into pJY4164. The *tnpR* gene encodes resolvase, a site-specific recombinase that excises DNA between direct repeats of a sequence called *res*. Plasmids containing DNA fragments cloned adjacent to the *tnpR* gene will be transformed into a *S. pneumoniae* reporter strain carrying a kanamycin resistance gene flanked by *res* sites. When a cloned promoter transcribes *tnpR* in the reporter strain, resolvase will excise the kanamycin resistance gene through its action at the *res* sites, and the bacterium will become sensitive to kanamycin. Characterization of genes isolated in this manner will lead to an increased understanding of the pathogenesis of *S. pneumoniae*.

BROCK, GINA R. Mu Iota, Northern Kentucky University -The effect of temperature on male courtship signaling in the "wing-banger" cicada, *Playtpedia mohavensis.*

Playtpedia mohavensis is an annual cicada that occurs in the mixed coniferous forests of the southern Rocky Mountains. They are active from mid-May to mid-June when the weather in the region is variable. In this species the tymbal, the sound-producing organ used by the males of most cicada species to produce courtship songs, is vestigial. In *P. mohavensis* courtship signals are produced by the males slapping their forewings onto tree branches or the sides of their abdomens. Studies of tymbal-signaling species of similar size and from the same region show that other species spend considerably more effort in thermoregulation with signaling occurring only over a very narrow temperature range. Measurements of perch and thoracic temperature show that *P. mohavensis* is more of a thermconformer than are most other species of cicada. We hypothesize that the wing-banging mode of signaling allows these cicadas to produce effective signals over a relatively large range of temperature. We recorded signaling of a sample of *P. mohavensis* males that we then captured and measured their perch and thoracic temperatures. Sonogram analysis of the signals reveals that while certain signal characteristics are influenced by temperature, other characteristics, such as the total number of wing-bangs made per minute, appear to be independent of temperature.

HARRIS, BRYAN T. Mu Iota, Northern Kentucky University -Effect of activated carbon water treatment (GAC) on biofilm formation in dental water lines.

The stagnation of water in dental unit water lines (DUWL) combined with the small diameter in the tubing results in a build-up of biofilm. This study investigated the effect of an activated carbon filter treatment in municipal water on the formation on biofilm. Water samples from dental offices supplied by water treated with standard processing (sedimentation and chlorination) were compared to offices supplied by water with standard treatment plus granulated activated carbon (GAC) treatment. The GAC process reduces total organic carbon (TOC) in the water supply. This may reduce bacterial levels. The results indicate that offices supplied with water treated by the GAC process show considerably lower bacterial counts than offices not supplied by this process.

GUZMAN, JOCELYN DE. Sigma, University of Tennessee at Chattanooga -A survey of the macroscopic fungi of the Lula Lake Land Trust.

A survey of the macroscopic fungi of the Lula Lake Land Trust was conducted from May 29, 1999 to March 8, 2000. The purpose of this study centered on making a comprehensive list of the macroscopic fungi to serve as baseline data of the fungal diversity contained on this experimental chestnut orchard. The study yielded over 50 species of mushrooms representing 17 families. The collection site is approximately one acre of an experimental hybrid chestnut orchard in an open Oak-Hickory-Pine woods near Lula Lake, on Lookout Mountain, Georgia, at an elevation of about 600 m above sea level.

TRI BETA DISTRICT I & II PAPERS

WELCH, RUTH ANN, JULIE BALLENGER, AND CLAY HILTON. Mu Omicron, Columbus State University -A molecular comparison of an enclosed population of white-tailed deer with two adjacent free-roaming herds in west-central Georgia.

A molecular survey on three white-tailed deer populations was conducted in west-central Georgia. One population is partially enclosed on the ground of an industrial site in northeast Muscogee County. This population shows an extremely high rate of the piebald anomaly, a recessive genetic trait, which is morphologically expressed in a variety of forms including patches of white in the coat and abnormal physical development, skeletal confirmation, and organ structure. This high rate of piebalding may be caused by genetic isolation or indicative of gene fixation in this population. As comparison, two adjacent free ranging populations were sampled, one from Harris County and the other from Marion County. Using starch gel electrophoresis, the level of genetic variation in each herd was determined. Five gel types were utilized to examine allele frequencies from 19 different enzymes. Analysis of red cells, plasma, and muscle from fifteen individuals in each population indicates

variation at eight loci. The enclosed deer seem to be highly variable over these loci. Statistical tests are being conducted to analyze multi-locus heterozygosity (H), percentage of polymorphic loci (P), and alleles per locus (A). The results will be used to assess the condition of the free ranging herds and for future management of the captive herd.

GARNER, ROBERT G. Mu Omicron, Columbus State University -Randomly amplified polymorphic DNA (RAPD) analysis of southeastern populations of loggerhead sea turtles, *Caretta caretta*.

The Atlantic loggerhead's life span (*Caretta caretta*) is approximately fifty to sixty years in duration. During this time, the loggerhead undergoes a variety of developmental stages and travels many miles before returning to their natal beaches to breed and nest. Copulation takes place just offshore early in the season. Following copulation, female loggerheads come ashore at night to excavate a nest and lay their eggs. The life cycle will begin anew when the hatchlings emerge from the nest and make their way to the sea. The Southeastern United States is the largest nesting area for the Atlantic loggerhead boasting approximately 90% of the Atlantic loggerhead reproductive effort. It has been proposed that three distinct populations inhabit this region. The first population ranges from North Carolina to Northeastern Florida. The second population ranges from Southeastern Florida to Southwestern Florida. The third population consists of the Northwestern Florida panhandle. Tagging and mtDNA work has confirmed these three distinct populations. However, since mitochondrial inheritance is maternal, only half of the genome is available for examination. Since RAPD techniques are nuclear based and examine both maternal and paternal genetic material this technique has been chosen to further define sub-populations within these ranges.

HARRISON, JASON. Mu Omicron, Columbus State University -A geographic comparison of the prevalence in Georgia estuaries of the parasitic dinoflagellate *Hematodinium sp.* in the Blue crab, *Callinectes sapidus*.

The blue crab, *Callinectes sapidus*, is economically and ecologically one of the most important crustaceans found along the Atlantic and Gulf coasts. The blue crab fishery of coastal Georgia has seen major declines in productivity over the past five years, and there has been much speculation among fishermen and biologists as to the possible causes of this decline. Many suspect these variations in productivity are the result of disease and environmental stress. The parasitic dinoflagellate *Hematodinium sp.* has adversely affected blue crab populations along the East Coast. Blue crabs were sampled from six Georgia estuaries ranging from the St. Marys River to the Savannah River. A histologic analysis of the specimens revealed the presence of the parasite in all six estuaries. The findings indicate that the prevalence of infection by *Hematodinium sp.* in blue crab populations vary significantly among several of these estuaries. Reasons for these variations are highly speculative, and additional data are necessary to validate any strong associations between specific environmental conditions and the prevalence of this

disease. However, initial investigation of point-source pollution sites in coastal Georgia suggests that human impact in these regions may increase the blue crab's susceptibility to the parasite.

CHANCE, KENNITH B. Eta Phi, Maryville College -Comparisons of stream qualities of three creeks using water quality analyses, the index of biotic integrity, and the EPT index for benthic macroinvertebrates.

The problem of water pollution is a growing concern in aquatic ecology. The goal of this study was to observe several different factors that help determine the health of a stream, and to use the data collected in comparisons between three local streams and with previous studies of each. The aspects of the streams that were studied are the benthic macroinvertebrate populations, fish fauna, presence of coliform bacteria, and the chemical and physical analysis of the water. The benthic macroinvertebrate and fish sampling were done in conjunction with the Tennessee Valley Authority (TVA), using their versions of the EPT Index for benthic macroinvertebrates and the Index of Biotic Integrity (IBI) for fish fauna. The preliminary trends in the data point to a decline in health for one of the streams due to point source pollution, but general increase in health of the two other streams due, in part, to efforts made in these areas to control non-point source pollution.

BLACK, WHITNEY. Eta Phi, Maryville College -Isolation and identification of flavodoxin in cyanobacteria.

An essential issue in ecological science is the identification of factors affecting the productivity of aquatic environments. Iron limitation has been shown to be one of these factors in cyanobacteria. The protein flavodoxin, which replaces the photosynthetic electron acceptor ferredoxin during iron stress, has been proposed as a marker for this condition. The purpose of this study was to design oligonucleotide primer sequences so that flavodoxin could be isolated and identified using polymerase chain reaction (PCR) technology. Tentative results suggest the positive identification of the flavodoxin gene in the cyanobacterial species tested. This information may become useful in the future through the *in situ* use of PCR in natural populations to determine iron stress and productivity.

LEROY, TIM. Eta Phi, Maryville College -Bactericidal properties of propolis, a natural medicine.

With the increasing emergence of alternative medicines in society, the need for scientific research of these medicines has also increased. Propolis is one such medicine, and it is claimed to have antibacterial properties. Propolis is a plant resin that is harvested by bees and mixed with saliva and certain polysaccides. Experimentally extracted propolis has been found to have some of these bactericidal properties. This experiment is to determine if commercial propolis products are also active antibacterials. Using an experimental procedure similar to the Kirby-Bauer

method, zones of inhibition were examined using three commercially produced samples of propolis and five common broad spectrum antibiotics. The antibiotics included, penicillin, a tetracycline, a quinolone, a sulfa/trimethoprim, and ampicillin. Six gram-positive and six gram-negative bacterial species were used in the experiment. All three propolis samples showed some antibacterial activity. In general the propolis samples worked more effectively against gram-positive bacteria than gram-negative. These results are consistent with the literature. The antimicrobial mechanism of propolis is still unclear, and should be determined in the future. Clinical studies should also be undertaken to determine its practical uses for the public.

HEWITT, ELIZABETH A. Eta Phi, Maryville College -A histological analysis of thyroid glands in juvenile alligators (*Alligator mississippiensis*) from contaminated and reference sites on Lake Okeechobee in Florida, USA.

Exposure to environment contamination has been shown to alter thyroid function in various wildlife species, including the American alligator. Elevated circulating levels of the thyroid hormone thyroxine (T_4) have been reported in juvenile alligators from a contaminated lake in Florida (Lake Okeechobee). In order to elucidate these functional abnormalities, this study examines structural abnormalities in the thyroids of juvenile alligators collected from three sites on Lake Okeechobee. The following variables were used to characterize thyroid morphology: epithelial cell height, width, and area; percent colloid; and follicle area. These variables were compared among study sites and between genders. No difference was detected in epithelial cell height, epithelial cell area, or follicle area among the sites, whereas significant differences in epithelial cell width and percent colloid were found. Animals from the most contaminated site (Belle Glade) had significantly greater epithelial cell widths ($p=0.0304$) and significantly less colloid present within their follicles ($p=0.0223$) compared to animals from the reference site. No difference between males and females was found for any variable. The results indicate that structural abnormalities do exist in juvenile alligators on Lake Okeechobee; thus, elevated circulating T_4 levels in this population may be attributed to tissue-level endocrine disruption.

WARES, CATHERINE. Tau Lambda, University of North Carolina-Charlotte -
Regulation of cyclic nucleotides by steroid hormones in mouse blastocysts.

Previous studies have proposed that the ratio of cGMP to cAMP may be important in the regulation of preimplantation embryonic growth and development. We have previously shown that estrogen increases nitric oxide (NO) production and inhibition of this response alters normal embryonic development. The increased NO may increase cGMP levels and alter the cAMP:cGMP ratio. Our hypothesis is that estrogen regulates the embryonic response during implantation by increasing cGMP levels via increased NO. The concentrations of cAMP and cGMP during murine embryonic development have yet to be determined. Therefore, our objective was to determine the concentration of cAMP and cGMP in murine preimplantation embryos, with and without estrogen exposure. After one-hour exposure to estrogen, the

embryos were flushed from uteri and cultured for two hours with the NO inhibitor, NG-nitro-L-arginine methyl ester; arginine; or the NO donor, S-Nitroso-N-acetylpenacillamine. NO concentrations were determined indirectly by measurement of nitrites (NO_2-) in the spent culture media. Nitrites are stable degradation products of NO and are considered to be a reliable indicator of NO production in cell cultures. Concentrations of both cAMP and cGMP in the embryos were determined using an enzyme linked immunosorbent assay kit.

PLINER, J.P., C. BROWN, K. MCKINNEY, AND R.S. OSTROWSKI. Tau Lambda, University of North Carolina-Charlotte -Associations of gene variations in alpha adducin and beta-2 adrenergic receptor genes with essential hypertension.

Hypertension affects approximately 50 million Americans and is a major risk factor in the development of cardiovascular disease, kidney failure, and stroke. Hypertension is a complex disease in which several genes and environmental factors likely interact to result in the clinical expression of the disease. This study determined if common sequence alterations in the alpha adducin and beta-2 adrenergic receptor genes were associated with development of hypertension. The study group was composed of individuals with hypertension and age-matched normotensive controls. Each consenting individual was genotyped utilizing either a coupled polymerase chain reaction / fluorescent oligonucleotide ligation assay or a polymerase chain reaction / restriction enzyme digest. The identification of genetic factors that predispose to the onset of hypertension will allow the detection of at-risk individuals prior to the onset of disease and allow treatment to be tailored to the underlying basis of disease.

ROEDER, KATHERINE. Tau Lambda, University of North Carolina-Charlotte - Determination of the role of the viable but nonculturable condition in infection of cauliflower plants by *Xanthomonas campestris*.

Researchers have recently begun to study bacteria kept in conditions that reflect environmental stresses encountered outside of the laboratory. Many bacterial genera have been found to respond to some environmental stresses by entering a state called viable but nonculturable (VBNC). VBNC is defined as the inability of viable bacterial cells to undergo detectable growth on non-selective nutrient media. The *Bac*Light LIVE/DEAD Bacteria Viability Assay (Molecular Probes, Eugene, OR) differentiates cells having an intact (i.e. viable) or degrading (i.e. dead) cell membrane. It has not been determined how widespread the VBNC condition is in the environment or how relevant VBNC bacteria may be to explaining phenomena such as the appearance of bacteria-caused disease, the efficacy of biocides, or the monitoring of GE bacteria in soil. This study examined *Xanthomonas campestris* (a plant pathogen that causes black rot and which was previously shown to become VBNC in soil) to determine if this species enters the VBNC state *in vivo* and, if so, when during infection cells become VBNC. VBNC cells were found within one day after infection and remained in the plant throughout infection. Experiments are

ongoing to determine if the number of VBNC cells changes during the infection process.

LIACOURAS, PETER. Psi Beta, James Madison University -Mathematical modeling of the desensitization kinetics of the acetylcholine receptors of *Schistosoma mansoni.*

The objective of this research effort was to study the electrophysiological characteristics of the acetylcholine receptors (AchoRs) of the schistosomatoidea, the family of helminths that causes schistosomiasis, a globally prevalent parasitic infection. This family includes the species: *Schistosoma mansoni*, *Schistosoma heamatobium* and *Schistosoma japonicum*. Characterizing the receptors expressed in oocytes of *Xenopus laevis* injected with mRNA extracted from the central nervous system and muscle tissue of *Schistosoma mansoni* is of extreme importance, and may allow development of more effective antihelminth therapies. Using desensitization kinetics of schistosomatoidea AchoRs expressed in *Xenopus laevis*, a mathematical model of the desensitization kinetics is currently being developed which will aid in understanding the nature of these biochemical receptors, a requisite preliminary step in cloning these receptors. In this project MAPLE and Microsoft EXCEL are being used for the mathematical models. This research may provide insights into the rationale design of more effective antihelminth drugs with minimal side effects to the patient.

ERVIN, KATHLEEN, Psi Beta, James Madison University -Preliminary determination of subunit stoichiometry of acetylcholine receptors from *Schistosoma mansoni.*

Schistosomiasis is contracted by contact with water infected with the helminths of the genus *Schistosoma*, including *Schistosoma mansoni*. Currently the most effective antihelminth drugs target acetylcholine receptors (AchoRs) of schistosomes since these are implicated in movement and feeding in the parasite. However, current drugs are not only targeting the parasite's AchoRs, but also the host's. Once more is known about helminth AchoRs more improved antihelminth drugs will be able to be made. This research project was designed to begin the process of characterizing the AchoRs in schistosomes by determining their subunit stoichiometry. This was accomplished in two ways. First, *S. mansoni* mRNA was injected *Xenopus laevis* oocytes. Oocytes were tested for AchoR expression by two-electrode voltage clamping. AchoRs were extracted from oocytes with affinity chromatography using -bungarotoxin and analyzed with SDSPAGE. In the second, a low stringency Southern blot using full-length cDNA probes corresponding to vertebrate AchoR subunits was performed. Preliminary Southern blots suggest that there is one type of subunit in *S. mansoni* AchoR. Ongoing SDSPAGE analysis is designed to determine if only one type of subunit exists, or if the cDNA probe was too divergent from the sequence of the other subunits to be detected by blotting.

TRI BETA DISTRICT I POSTERS

SLAUGHTER, JONATHAN LEE. Tau Eta, Catawba College -Refolding of recombinant human group X sPLA2 enzyme.

Group X Secretory Phospholipase A2 (hX-sPLA2) is believed to play an important role in asthmatic inflammation by hydrolyzing phospholipids into arachidonic acid and lysophospholipid. An enzymatically active recombinant hX-sPLA2 has been produced in mammalian Cos-1 cells. However, protein yield is low, complicating efforts to purify and concentrate the enzyme. Large amounts of recombinant hX-sPLA2 can be produced in *E. coli*, although this enzyme is inactive due to improper folding. We reduced and solubilized the *E. coli* expressed rhX-sPLA2 and properly refolded it through re-oxidation of the disulfide bonds with cysteine. The sPLA2 was assayed and enzymatic activity was detected. The presence of rhX-sPLA2 in the final product was confirmed by SDS-PAGE Western Blot Analysis.

TOLBERT, JESSICA. Tau Eta, Catawba College -Immunostimulatory effects of murine interferon- and interleukin-12 on *Schistosoma mansoni*.

Schistosomiasis is a parasitic disease which infects over 300 million people. The infection down-regulates the immune response from Th1 mediated immunity, or cell-mediated immunity, to Th2 mediated immunity or, antibody immunity. The cytokines, interferon- (IFN-) and interleukin-12 (IL-12) are known to upregulate the immune response by limiting Th2 proliferation. The main purpose of this research was to determine the efficacy of treating mice with murine IFN- in tandem with IL-12 prior to and during infection with *Schistosoma mansoni*. Egg and worm burdens were obtained upon necropsy and peripheral T-lymphocytes were quantified. Reduced egg counts and worm burdens and increased T-cell levels were observed in cytokine treated mice vs. controls. Also, the cytokines had an additive effect.

THOMPSON, CHRISTINA. Sigma Psi, Florida Institute of Technology -Somatic embryogenesis in cantaloupe and the effect of the length of the induction phase on the number of embryos.

Rocky Ford Green Flesh Cantaloupe seeds were dissected, sterilized, cut into nine pieces, and transferred onto a petri dish containing media with specific hormones. The dishes were maintained in complete darkness for 7, 10, 13, 15 days. They were then transferred to dishes containing media without hormones. After three weeks, the number of somatic embryos that formed following the 7, 10, 13, and 15 days of darkness for all five replicates respectively were 109, 61, 15, and 16; the number of shoots were 52, 5, 15, and 3. Out of the four variations, the 7 day treatment produced the most amount of embryos. The embryos were dominant in the basal cotyledonary explants.

LATUSEK, JENNIFER N. Sigma Psi, Florida Institute of Technology -Photo-identification, distribution, and behavior patterns of Atlantic bottlenose dolphins, *Tursiops truncatus,* in the Indian River Lagoon, Florida.

Dolphin distribution and behaviors were examined by shore-based and boat-based surveys primarily from the Pineda Causeway southward to Sebastian during October 1999 to present. The total number of dolphins sighted to date during boat-based surveys is approximately 50 to 59 individuals. Group size ranges were between 1 and 12 with the most common size comprising 2 individuals. Juveniles were associated with approximately 33% of the dolphins groups. Overall, feeding was the most common behavior observed during boat-based surveys, comprising 66% of total observations. Shorelines were the most utilized habitat (66%), primarily for feeding. In addition, dolphins were sighted 22% of the observation in channels, mainly traveling. Upon examination of the *T. truncatus* database of this ecosystem, two individuals have been identified; others are still being processed. During land surveys, approximately 23 to 26 individuals have been sighted. One individual was the common group size at 43%. Juvenile associations were only observed in one group, 14.5%. Overall, the dominant behavior was feeding observed during 50% of the observation periods while traveling occurred during 33%. Areas most utilized were spoil islands and channels at 43%, each. Habitat activity patterns follow the aforementioned boat-based observations.

SARKAR, MARTIN AND MARK CHOI. Beta Omega, Mercer University -Colonization patterns of artifical substrate in a middle Georgia stream.

Streams in Middle Georgia generally suffer from heavy siltation and are subsequently substrate-limited in terms of biological diversity. Colonization studies have tended to focus on the addition of labile, biodegradable substrates (*e.g.*, wooden constructs) that introduce the compounding factor of nutrient enrichment. To avoid this, an experimental approach was designed that increased substrate availability without the introduction of biodegradation. Six, identical stations were tethered in Falling Creek of the Piedmont in selected locations with similar flow and depth characteristics. Each station consisted of six pods of standardized, nylon mesh-enclosed polypropylene and nylon "leaves" that were randomly sampled over a 4-month period. Invertebrate indices were correlated with both physical (*i.e.*, flow rates, rainfall, DO_2, and temperature) and biological (*e.g.*, phenology and invertebrate drift) parameters. This independent, undergraduate research project was supported jointly by the Mercer University Biology Department and the Georgia Forestry Commission.

CHRISTOPHER, SHANNON L. Psi, Winthrop University -The origin of bouligand patterns in the Kombucha mushroom.

The Kombucha mushroom is a symbiosis of yeast and bacteria that appears to form intricate bouligand patterns with its fibers during development. It is believed that the bouligand patterns form during the later part of the mushroom's development and

that stress has a negative effect on the formation of the bouligand patterns. For all experiments, the mushroom mats were grown in freshly brewed sweet tea (50g sucrose/500 ml tea). A time course experiment was performed on the mushroom and cultures were fixed after 14, 10, 6, 4, 3, and 2 days of growth. Also, the mushroom was subjected to a tension experiment to determine if the presence of tension during growth affected the appearance of bouligand patterns. For the tension experiments, a round button was placed underneath the culture and connected to a wire through the culture. This wire was connected to a weight and pulley system that exerted different forces on the culture. Another culture was grown while being agitated by an air stone. The Kombucha mats were cut into sections and sliced using a Vibratome and then fixed for scanning electron microscopy. The results of these experiments will be discussed.

REKOW, MEGAN, Psi, Winthrop University -A behavioral assay of stress in captive DeBrazza's monkeys (*Cercopithecus neglectus*).

Behavior of a captive group of DeBrazza's Monkeys was studied to determine factors causing social stress. The group consisted of four individual; a juvenile female, juvenile male, adult female and adult male. The research was conducted at Riverbanks Zoo in Columbia, South Carolina, from October 1999 to March 2000. Acts of aggression were considered primarily when testing for stress. The most common acts of aggression were chasing, batting, lunging and teeth baring. While the overall number of aggressive acts from one monkey to another was relatively low, the greatest number seemed to be initiated by the juvenile male and directed to the adult female. Her general behavior also seemed to indicate some degree of stress; she spent a great deal of time pacing, staying low to the ground, and avoiding close proximity to the other monkeys, especially when feeding. Overall, acts of aggression increased as the juvenile female approached puberty.

BARWICK, JENNIFER. Psi, Winthrop University -Phylum Gastrotricha: member of the Ecdysozoa?

Gastrotrichs are acoelomate worms that have a distinctive trilaminar cuticle. Currently, Phylum Gastrotricha is excluded from the group Ecdysozoa because Gastrotrichs do not molt their cuticles. Phylum Nematoda and Phylum Arthropoda are grouped in the Ecdysozoa on the basis of common molting hormones, even though their morphological characteristics are very different. The cuticles of representative gastrotrichs, nematodes, and arthropods have been examined and compared using lectins as molecular tags. Lectin affinities were used because they offer the potential to study biochemical similarities in the carbohydrate composition of various cuticles. The stains were analyzed using FITC fluorescence microscopy and results are still being collected. If the biochemical similarities between cuticles are significant, this research will serve as evidence that the Ecdysozoan relationship be extended to include Phylum Gastrotricha, regardless of its lack of a molting mechanism.

HO, ELLIS (WING TAI). Tau Eta, Catawba College -Analysis of red pigment in "a" and " " strains of *Saccharomyces cerevisae.*

The formation of red pigment occurs in the yeast *Saccharomyces cerevisae* when the either ade1 or ade2 gene in the adenine monophosphate biosynthetic pathway is mutated. An assay of the red pigment was done to investigate the relative concentration between the haploid mating type "a" and mating type " " and diploid strains "a/ " of the ade2 gene in *Saccharomyces cerevisae*. The red pigment was extracted from these cells and the absorbance was measured at 530nm on the UV/VIS spectrophotometer. For the ade2 mating type "a" strain, the average absorbance value was 0.3665 and the ade2 mating type " " was 1.2766. This result showed that the ade2 " " strain produces 3 times more red pigment than the ade2 "a" strain. In both "a" and " " wild-type haploid strains, absorbance was 0 at 530nm which indicated that red pigment formation did not occur in these cells. The ade2/ade2 diploid "a/ " showed pigment production, while heterozygotes and wild-type showed no pigmentation. This indicated the ade2 gene is dominant for the wild type strains of *Saccharomyces cerevisae*.

RUSTIN, CHRIS, MICHAEL MURRAY, AND JON TEEL. Tau Chi, Armstrong Atlantic State University -The fate of extracellular DNA in a polluted river system.

The goal of this project was to determine the survivability of a genetically engineered *E. coli* strain and the rate of degradation in a polluted river system. Three water samples were taken from the Altamaha River at various sites. The Rayoneer Paper Company discharges its effluent into this river. Samples were taken at the point of discharge and upstream and downstream of the effluent discharge. Survival studies were performed using flask microcosms containing filter sterilized river water and the genetically engineered clone. Bacterial concentrations were determined at days 1, 3, 5, 8, and 14 using the microdrop technique. Bacteria were plated on both LB and LB+amp+x-gal plates to determine stability of the cloned plasmid vector. The degradation of extracellular DNA was also studied by inoculating the samples with both chromosomal and plasmid DNA. Degradation was followed at 15 minutes, 1 hour, 3 hours, 6 hours, and 10 hours. Samples were subjected to a DNA recovery method and the DNA was analyzed using agarose gel electrophoresis. Results indicate that, (1) the genetically engineered clone survived well in all three-river samples, (2) genetic stability decreased over time, (3) both chromosomal and plasmid DNA degraded over time.

MENDES, SHANNON W. AND CINDY N. ACHAT. Tau Chi, Armstrong Atlantic State University -Fate of extracellular DNA in a mercury contaminated superfund site.

This research investigated the degradation rates of genetically engineered extracellular DNA in mercury contaminated water. A soil sample from a mercury contaminated superfund site in Brunswick, GA was resuspended in a buffered

solution and shaken for 48 hours. The soil sample was centrifuged and filtered to remove large soil particles. The remaining water was used to study the degradation of chromosomal and plasmid DNA isolated from a genetically engineered *E. coli* strain. Studies were performed on untreated water samples, filter sterilized water samples and autoclaved water samples to determine the effects of biotic and abiotic factors on rates of DNA degradation. Water samples were inoculated with chromosomal and plasmid DNA and subjected to a DNA recovery procedure after 15 minutes, 30 minutes, 1 hour, 3 hours, 5 hours, and 20 hours. DNA degradation was followed by agarose gel electrophoresis. Results indicate that 1) degradation of both chromosomal and plasmid DNA occurred in all samples, 2) the greatest degradation occurred in the untreated sample with most of the DNA degrading after 5 hours, 3) very little degradation occurred in the autoclaved sample, 4) both biotic and abiotic factors play a role in DNA degradation.

ELLIOTT, KARINDA, BARRY LOLLIS, WHITNI DAVIDSON, AND ANNA BURTON. Tau Chi, Armstrong Atlantic State University -Degradation of genetically engineered *E. coli* and the fate of its extracellular DNA in three freshwater systems.

This study was done to determine the survival of a genetically engineered *E. coli* strain and the fate of its extracellular DNA in three freshwater systems. Survival studies were performed using flask-microcosms containing pristine lake water, polluted lake water, and golf course lake water. Samples were filter-sterilized prior to start of the survival study. Bacterial counts were determined at times 0, 1, 2, 5, 8, and 12 days using the micro-drop technique. Samples were plated on LB plates and LB+amp+Xgal plates to determine genetic stability of the inserted plasmid vector. Results indicate a decline in survival in polluted lake and golf course sample and a slight incline in the pristine environment. Results for genetic stability indicate that vector was stable. DNA degradation was performed on unfiltered water samples. Degradation of chromosomal and plasmid DNA was determined by agarose gel electrophoresis followed by DNA recovery procedure at the following time intervals: 15, 30 minutes, 1, 2, 5, 24, and 48 hours. Results indicate that (1) chromosomal and plasmid DNA degraded in all samples; (2) the greatest degradation occurred in golf course water samples and the least degradation occurred in pristine water samples; (3) structural changes occurred in plasmid and chromosomal DNA.

CRAIG, STEPHANIE A., RYAN T. SMITH, BOBBY E. SMITH, AND SPEROS LIVIERATOS. Tau Chi, Armstrong Atlantic State University -Chromosomal and plasmid DNA degradation and its effect on transformation.

The fate of extracellular DNA and its effect on the transformation of competent cells was studied in three different aquatic environments. Water samples were collected from the Savannah River near an industrial site, upstream of the site, and downstream of the site. DNA degradation studies were performed by inoculating water samples with both chromosomal and plasmid DNA and following their degradation at the following time intervals: 15 minutes, 30 minutes, 1 hour, 5 hours,

1 day and 2 days. DNA was recovered using a DNA recovery procedure and subjected to agarose gel electrophoresis. Simultaneous studies were also performed to determine the effect of DNA degradation on the possibility of transformation. Samples were removed and added to competent cells to determine transformation efficiencies at the following time intervals: 45 minutes, 5 hours and 1 day. Results indicate that (1) both chromosomal and plasmid DNA degradation occurred in all three samples (upstream, downstream, and at the industrial site), (2) greatest degradation occurred upstream of the industrial site and the least amount of degradation occurred downstream of the site, (3) competent cells did transform at all time intervals for all three sites.

SMITH, BOBBY E., SPEROS LIVIERATOS, STEPHANIE A. CRAIG, AND RYAN T. SMITH. Tau Chi, Armstrong Atlantic State University -Survival of a genetically engineered *E. coli* strain and its genomic stability in aquatic environments.

This study looked at the survival of a genetically engineered strain of *E. coli* DH5 containing pGEM with a *lux* gene insert. Survival studies were performed using three river samples; one sample was obtained upstream from an industrial site, another sample from the point of discharge, and the third sample was obtained downstream of the industrial site. Triplicate flask microcosms were used for survival studies. Samples were analyzed at time 0, 48, 96, 192, 240, and 360 hours. Bacterial concentrations were analyzed using the micro-drop technique on both LB plates and LB+amp+X-gal plates. Genetic stability was determined by observing the differences between the LB plates and the LB+amp+X-gal plates. Results indicate that (1) the genetically engineered clone survived well in all three environments (upstream, at site, and downstream), (2) there appears to be no difference in survival between the three sites, (3) genetic stability decreased over time with the greatest loss of plasmid observed at the downstream site followed by the industrial site.

THOMAS, BRADLEY. Beta Rho, Wake Forest University -Dorsal fin use during the escape response in the Harlequin basslet, *Serranus tigrinus*.

In this research, the mechanics of the dorsal fin of the Harlequin basslet (*Serranus tigrinus*) are currently being evaluated. Several properties of the dorsal fin are being studied; kinematics of fin movement using high-speed video, motor pattern using electromyography. The goal of this is to determine the locomotor properties of the dorsal fin of the Harlequin basslet (*Serranus tigrinus*), so that they can be compared to the dorsal fin muscles of the pipefish (*Syngnathus*: Syngnathidae) and the seahorse (*Hippocampus hudsonius*). The overall goal of this project is to investigate the evolutionary changes leading to a highly specialized locomotory method and organ. The *in vivo* experiments involve the use of high-speed video and electromyograms (by inserting bipolar fine wire electrodes into the dorsal fin muscle). This provides kinematic and motor pattern data.

CARAMANICA, JANET L. AND STEPHANIE PENROD. Psi Beta, James Madison University -Partial cDNA sequence of putative peptide antibiotic isolated from gastropod integument.

The integument of the terrestrial gastropod, *Limax maximus* possesses antibiotic activity which is apparently due to the production of peptide. We are attempting to clone the gene(s) associated with this peptide. Using BLASTX, we designed degenerate PCR primers corresponding to the most highly conserved regions of the phylogenetically most common antibiotic peptid genes (i.e. the defensins). A specific product was generated using RT-PCR and this was inserted into a vector (PCR 2.1, Invitrogen Inc.) and the recombinant vector was grown up in competent bacteria. Vector was isolated and the insert removed with ECOR I digestion and sent away to the Marine DNA sequencing Center at the Mount Desert Island Biological Laboratory. The resulting cDNA sequence generated a predicted peptide sequence of 200 amino acids and had two regions predicted to be membrane-spanning alpha helices as well as a high probability of the presence of a signal sequence (determined from Swiss Prot algorithms). The peptide sequence and the underlying cDNA sequence appear to be quite distinct from other peptide antibiotic sequences in known data bases (highest homology was 68% to an alpha-helix forming defensin from mussel). We are currently utilizing RACE to attempt to generate full length cDNA sequence of the gene.

FREEBORN, KATHRYN C. Sigma Gamma, Erskine College -Seasonal demographic survey for potentially pathogenic antibiotic resistant *Staphylococcus aureus.*

Four different age groups of an upstate South Carolina population were surveyed for the occurrence of potentially pathogenic *Staphylococcus aureus* on their fingertips. The experiment was carried out in late fall and early spring. Subjects pressed 3 fingertips (second, third, and fourth fingers) to the surface of Mannitol Salt Agar dispensed in Petri plates. If a yellow zone appeared around colonies after incubation, they were considered to be potentially pathogenic. These were subcultured and tested for antibiotic resistance using the Kirby-Bauer Method. Carriers of potentially pathogenic *Staphylococcus aureus* and occurrence of antibiotic resistance were determined and analyzed statistically by age and season.

HUDSON, ROBERT S. AND MARIJOHN NORWOOD. Tau Omicron, Francis Marion University -Comparison of two methods of DNA isolation from shed snake skins.

The ability to isolate relatively pure DNA from shed snake skins collected in the field or from captive specimens serves as a noninvasive as well as inexpensive technique for sampling the genetic diversity of snakes and other reptiles. In this study, methods of isolation were analyzed and compared for their relative yields and purities using UV spectroscopy. DNA of three species of snakes: *Nerodia fasciata*, *Elaphe guttata*, and *Python regius* were isolated with two methods, which differed in the prescribed

digestion, extraction, and precipitation schemes. The first method incorporated the use of CTAB, proteinase K, and 2-mercaptoethanol in the digestion followed by phenol/chloroform extractions and then an ethanol/sodium acetate precipitation. The second method involved proteinase K, cell lysis buffer and RNAse A in the digestion and isopropanol/ammonium acetate in the precipitation. Yields of DNA varied from 3.2 g/ l from the first method to .15 g/ l from the second method, whereas the levels of purity between the two methods showed no significant difference.

TRI BETA DISTRICT II POSTERS

WEBER, LAURA. Mu Chi, Midway College -The effect of human contact on the heart rate of the horse.

The heart rate of vertebrate animals is an indication of fear, pain, sickness, or excitement. Equine massage is being emphasized today as a technique to help relax athletic horses. This study was designed to determine if there was a difference in the effects of petting and massage on heart rate. A heart rate monitor was used to record the heart rate of six horses during and after massage and petting treatments. It was hypothesized that both massage and petting would lower the heart rate, with massage having the greatest effect. However, the data did not support the hypothesis. The average heart rate during and after the massage treatment was not different than the average pre-treatment heart rates, while the average petting heart rate was two to four beats per minute lower.

BAIRD, ALISON. Pi Delta, East Tennessee State University -Dynamics of honeybee timekeeping: Individual forager contributions to a group response.

Honey bees (*Apis mellifera*) learn the time of day that flowers produce nectar and will organize their foraging flights to match the species-specific rhythms of nectar secretion. Remarkably, foragers can be trained to associate, with a high degree of accuracy, virtually any time of day with a food reward. To efficiently exploit available resources in the environment, the colony dispatches a distinct foraging group (often containing hundreds of individuals) to each food source. Previous studies on timekeeping ability have focused on the accuracy in time of this foraging group as a single unit. But what is the contribution of the individual forager? Time training field experiments, using individually marked foragers, reveal temporal dynamics within the foraging group and suggest the existence of a division of labor. Some individuals continue to visit an unrewarded training station for at least three consecutive days while other remain in the hive. “Persistent” foragers show no diminution in the accuracy of their time-memory and “lazy” foragers are readily re-recruited at the same training time. Because assignment to a subgroup is neither random nor a function of the number of training rewards, it may be attributed to behavioral differences among different genetic patrilines within the colony.

GAMMILL, JENNIE. Beta Phi, University of West Alabama -Effects of varying salinity on *Gambusia affinis* from an inland saline ecosystem.

Mosquitofish (*Gambusia affinis*) were collected from two populations in Fred Stimpson Wildlife Refuge near Jackson, AL. One population occupies an inland brackish habitat, while the other is found in adjacent freshwater habitats. Experiments were conducted to determine the effect of changing salinity on respiration in the two populations. Respiratory rates were determined for both groups at 5 ppt salinity increments. In general, respiratory rates increased with salinity. In fish collected from brackish habitats, a dramatic increase was noted between 40 and 45 ppt. Respiratory rates for fish collected from freshwater habitats did not increase as dramatically. Beyond this point, respiratory rates declined in both groups. Additional experiments were conducted to investigate reproductive interactions between the two populations.

MILLAY, DOUG. Mu Iota, Northern Kentucky University -Effect of androstenedione on fertility rates in female rats and the in utero effect of the hormone on the female rats' subsequent offspring.

Androstenedione (andro) is a steroid hormone that is a direct precursor to testosterone. Synthetic androstenedione is sold over the counter as an anabolic agent and is not regulated by the FDA because it is classified as a food supplement. Thirty female rats were fed an andro supplemented diet for one month and ten rats represented the control group and received rat chow without andro. Experimental group I (n=10) received 2X the amount of andro recommended by most manufacturers. This amount was adjusted to the rat's weight. Experimental group II (n=10) were fed an amount of andro that was 25X more than the recommendation by most manufacturers and the final experimental group (n=10) were fed 100X the amount of andro recommended. After one month each rat was mated with a male for one week. All forty rats had successful litters. There was no anti-fertility effect. The pups born to mothers exposed to androstenedione in the above study were used to measure the in utero effect of the hormone. The development of the female reproductive organs is dependent on the presence of androgens, therefore an excess of these hormones during gestation could cause pseudohermaphroditism in the female fetus. This study was carried out by mating non-sanguinous males and females from the above study. There were four groups of matings, with eight matings in each group. The first group represented the control group and matings occurred between male and female rats whose mothers ingested no andro during gestation. The second group of matings contained control male rats and female rats whose mothers were exposed to andro during pregnancy. The third group consisted of matings between control female rats and male rats whose mothers were exposed to andro. Male and female rats, both of whose mothers were exposed to andro during gestation were mated in the final group. All female rats had successful litters, indicating that andro, at the doses administered, does not have an in utero effect on the reproductive system of the developing fetus.

GOANS, CHRIS. Eta Phi, Maryville College -Freshwater mussel survey of Abrams Creek, Great Smoky Mountains National Park, Blount County, Tennessee.

Despite having the greatest diversity of freshwater mussels in the world, the Tennessee River drainage has lost approximately thirty-nine percent of its original mussel population due to habitat loss and exploitation. To further investigate the extent of mussel distribution particularly in mountain streams, a survey of Abrams Creek located in Blount County, Tennessee, part of the Great Smoky Mountains National Park was performed. Riffles, runs, and pools along the thirty-two kilometer stream were sampled via wading and snorkeling for freshwater mussel shells and live specimens. This survey also included muskrat midden searches. Several species were found including *Corbicula fluminea*, *Villosa iris*, and others that are awaiting classification. A correlation matrix will be prepared that investigates the relation of stream substrate composition, water velocity, and mussel species. Information obtained from this survey increases the known distribution of the existing freshwater mussel population of the Tennessee River drainage and the Great Smoky Mountains National Park.

MOSS, DAVID. Eta Phi, Maryville College -Species distribution study and ecology of the Tardigrada, Great Smoky Mountains National Park.

Data are limited concerning the ecology of the Tardigrada. There are few studies of the geographic distribution and richness of tardigrade species in the Southeastern United States, particularly in Great Smoky Mountains National Park (GSMNP). This study investigates the tardigrade species richness of two selected sites that differ by elevation within the boundaries of GSMNP; Abrams Creek backcountry camp #1 (363 m) and Icewater Springs trail shelter (1772 m). Tardigrade specimens were collected on 13-14 August 1999. Through microscopic verification, four total species were identified. Two of these species, *Macrobiotus intermedius* and *Milnesium tardigradum*, were common to both collection localities, however, two species were found to be uniquely associated by site. *Macrobiotus tonollilareolatus* was found only at Abrams Creek backcountry camp #1, and *Echiniscus gladiator*, the only Heterotardigrade encountered, was found only at Icewater Springs trail shelter. Further studies are needed to elucidate potential ecological factors associated with the distribution of tardigrade species in the Southeast.

GERTZ, KAREN. Eta Phi, Maryville College -A study comparing the accuracy of the serologic assay with the nested reverse transcriptase polymerase chain reaction in detecting feline coronavirus.

Feline Coronavirus (FCV) is a highly transmissible, enveloped RNA virus that affects both domestic and non-domestic felids. FCV may exist as serotype I, which encompasses 85% of all isolates, or serotype II, which closely resembles Canine Coronavirus in antigenicity. FCV is also classified as one of two biotypes, including Feline Enteric Coronavirus and Feline Infectious Peritonitis Virus. Indirect

immunofluorescence assay (IFA) and nested reverse transcriptase polymerase chain reaction (RT-nPCR) testing was completed on nineteen captive exotic cats. IFA testing involved the preparation of serum or plasma dilutions ranging from 1:5 to 1:320. Following RNA isolation from fecal samples, primers targeting the untranslated region (UTR) of the FCV genome were used in PCR amplification. Three cats exhibited FCV serotype I and II titers, while an additional seven cats were FCV II seropositive. Four cats presented with PCR positive results. Concerning IFA testing, false positive results may have occurred due to antibody cross-reactivity. Seropositive results may have merely indicated previous exposure to an FCV rather than current infection. In contrast, PCR positive results were identified as an electrophoretic band corresponding to the UTR segment of the FCV genome. Therefore, PCR testing was considered more accurate than IFA in diagnosing current FCV infection.

JONES, MARCUS. Eta Mu, Southern University -Strategies to identify *in vivo* expressed genes and putative virulence factors in *Mycobacterium tuberculosis.*

With the increase in multi-drug resistance strains of *Mycobacterium tuberculosis* (Mtb) over the last decade, the need to identify possible virulence genes as sites for drug targeting and the development of an attenuated vaccine strain of Mtb is pressing. We describe the use of two different approaches, computer analysis of the Mtb genome and the IVET system, to identify candidate virulence genes in *Mycobacterium tuberculosis*. By use of these two methods we have identified two candidate virulence genes, RV924c or Mramp, a homologue found in Mtb that is similar to the eukaryotic Natural Resistance Associated Macrophage Protein1 (Nramp1), and RV0288 an ESAT-6 like protein. We are in the process of inactivating the RV0288 gene by inserting a hygromycin resistance cassette in the middle of the gene to interrupt the gene sequence. We have inactivated the RV924c and are in the process of measuring mRNA levels expressed in macrophages and in broth culture through the use of molecular beacons coupled to reverse transcriptase-polymerase chain reaction (mbRT-PCR).

From Left: Dwayne Wise, Bonnie Kelly and Pat Cox.

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